

A.T. Kearney, Inc.
699 Prince Street
P.O. Box 1405
Alexandria, Virginia 22313
703 836 6210

Management
Consultants

December 30, 1986

ATKEARNEY

Mr. Mark Flachsbart
Regional Project Officer
U.S. Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

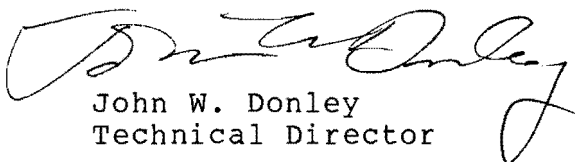
Reference: EPA Contract No. 68-01-7038; Work Assignment No.
R09-05-20; Chevron U.S.A. Inc., Hawaii; Final
Deliverable

Dear Mr. Flachsbart:

Enclosed are three copies of the final RCRA Facility Assessment for the Chevron Hawaiian Refinery on Oahu. The refinery has two land treatment units and a large number of wastewater treatment ponds, many of which are RCRA-regulated. There is a notable lack of unsaturated zone monitoring data in the facility's Part B application, a problem which should be corrected in order to understand whether the land treatment units are adequately operated as required by Subpart M. The facility has a groundwater contamination problem and is currently recovering useable oil from the groundwater. While it is important that the agency closely monitor the extent of the plume, it is not believed that there is a major health or environmental threat at this time.

If you have any questions, please call me or Barb Morson, the Work Assignment Manager (who can be reached at 206/747-7899).

Sincerely,


John W. Donley
Technical Director


Don R. Beasley
Program Director

Enclosure

cc: K. Breeden
J. Grieve
B. Morson, SAIC-B

**RCRA FACILITY ASSESSMENT
OF SOLID WASTE MANAGEMENT UNITS AT
CHEVRON U.S.A. INC. HAWAIIAN REFINERY
HAWAII**

EPA Region 9 I.D. Number HIT160010005

Submitted to:

**EPA Region 9
215 Fremont Street
San Francisco, California 94105**

Submitted by:

**A.T. Kearney, Inc.
699 Prince Street
Alexandria, Virginia 22313**

and

**Science Applications International Corporation
13400-B Northup Way, Suite 38
Bellevue, Washington 98005**

EPA Contract Number 68-01-7038

Kearney Work Assignment Number R09-05-20

SAIC Project Number 2-817-07-642-88

December 19, 1986

TABLE OF CONTENTS

	<u>Page</u>
Executive Summary.....	1
1.0 Introduction.....	3
2.0 Facility Description.....	4
2.1 Facility Description.....	4
2.2 Operating Permits.....	8
3.0 Environmental Setting.....	9
3.1 Location and Surrounding Land Use.....	9
3.2 Physical Geography and Meteorology.....	9
3.3 Geology and Hydrology.....	9
4.0 Description of Individual Units.....	12
4.1 Land Treatment Unit (RCRA Regulated).....	12
4.2 Inactive Land Treatment Area.....	14
4.3 API Separator.....	16
4.4 North Surge Pond.....	19
4.5 South Surge Pond.....	21
4.6 Oxidation Ponds.....	23
4.7 Neutralization Basin.....	25
4.8 Settling Basin.....	27
4.9 Impounding Basin.....	29
4.10 Outfall Sump.....	31
4.11 Induced Air Flotation Unit.....	33
4.12 Induced Air Flotation Pond (RCRA Regulated).....	35
4.13 Drum Storage Area.....	37
4.14 Flare Oily Basin (RCRA Regulated).....	39
4.15 Flare Lime Basin.....	41
4.16 Landfill A.....	43
4.17 Landfill B.....	45
4.18 Inactive Clay Dewatering Impoundment.....	47
4.19 Sewer Sludge Impoundment.....	49
4.20 Amine Washwater Impoundment.....	50
4.21 LPG Area Cooling Water Pond.....	52
4.22 South Ocean Pond.....	54
4.23 North Ocean Pond.....	56

4.24	Waste Pile A.....	58
4.25	Waste Pile B.....	60
4.26	Waste Pile C.....	62
4.27	Foul/Sour Water Tanks 303 and 304.....	64
4.28	Foul Water Oxidizer.....	66
4.29	Weak Acid Neutralization Sump.....	68
4.30	Strong Acid Neutralization Sump.....	69
4.31	Alkylation Plant Neutralization Sump.....	71
4.32	Storm Water Drainage Swale and Culvert.....	73
4.33	Clay Dewatering Basin.....	75
4.34	Oil Recovery Box.....	77
4.35	Oily Sewer System.....	79
4.36	Acid Sewer System.....	80
4.37	Storm Bay and Storm Sewer.....	81
5.0	Conclusions.....	83

Appendix 1 Visual Site Inspection Summary and Photographs

Appendix 2 Field Notes

EXECUTIVE SUMMARY

A RCRA facility assessment was conducted at the Chevron U.S.A., Inc. Hawaiian refinery at Ewa Beach, Oahu, Hawaii. This assessment has utilized the RCRA, CERCLA, and NPDES files of EPA Region 9, the files and reports of the Hawaii State Department of Health, Noise and Radiation Branch and Permits and Enforcement Branch. Further information was gathered during a visual site inspection at the facility on November 12-13, 1986.

The refinery began operation in 1960, and now processes approximately 50,000 barrels of crude oil per day. It manufactures fuels, acid, and asphalt for use in the Hawaiian Islands. Products include motor gasoline, jet fuel, fuel oil, liquefied petroleum gas, sulfuric acid, and asphalt.

During the course of this facility assessment, 37 solid waste management units (SWMUs) were identified at the refinery. All units were inspected during the visual site inspection. Three of the units, the land treatment unit, induced air flotation (IAF) pond, and the flare oily basin are RCRA regulated. Chevron intends to close the IAF pond and the flare oily basin as soon as the RCRA permit is issued.

Of the 37 SWMUs identified, 32 pose a potential for some type of release of hazardous constituents. Twenty seven of the units are believed to pose a potential for release of hazardous constituents to the soil or groundwater. These include the current and the inactive land treatment areas, the API separator, all impoundments and basins within the wastewater treatment system, the drum storage area, one inactive landfill, three wastepiles, one of which was located beneath the current land treatment unit, the inactive liquid petroleum gas (LPG) area cooling water pond, three neutralization sumps, the storm water drainage swale and culvert, the oil recovery box, and the oily, acid and storm water sewers.

Chevron currently has 17 monitoring wells on site which are sampled regularly to monitor for possible releases from waste management units. In addition to these wells, there are also 45 "delineation wells" which were installed to identify the extent of an oil plume on the water table beneath the refinery. The source of the oil is believed to be leaks from crude and product storage tanks.

Seven SWMUs pose a potential for ongoing releases to surface water, which in the case of the Chevron refinery is the Pacific Ocean. These include the API separator, the impounding basin, the IAF pond, the north and south ocean ponds, the oil recovery box, and the stormwater drainage swale and culvert. The stormwater drainage swale and culvert collects stormwater drainage from the southern portion of the refinery, including an area at the southern property boundary abutting the Brewer Chemical plant. It is likely that the swale collects waters containing hazardous constituents not only from the refinery but also from the chemical plant prior to discharging through the culvert south of the IAF unit into the Pacific Ocean. This discharge is not authorized by NPDES. Chevron intends to stop the discharge by the end of 1986, redirecting the storm water to the facility's storm water sewer.

Eighteen units across the facility pose a potential for air releases of hazardous constituents, in most cases hydrocarbons. These include the land treatment unit, the API separator, the wastewater treatment system ponds and basins, the clay dewatering basin, the storm water drainage swale and culvert, and the oil recovery box. Waste Pile C and the flare lime basin pose a potential for releases to air via windborne particulates.

The oily sewer system, a subsurface gravity flow system, may pose a potential for generation of hydrogen sulfide gas, which is both toxic and explosive.

1.0 INTRODUCTION

Chevron, U.S.A. Inc. operates a petroleum refinery located in Campbell Industrial Park at Ewa Beach, Oahu, Hawaii. The refinery began operation in 1960. (6,12) Prior to 1960 the land now occupied by the refinery was vacant. (13) Present refining operations produce motor gasoline, jet fuel, fuel oil, liquefied petroleum gas, sulfuric acid, and asphalt. The refinery is equipped with a wastewater treatment system to treat various oily and acid wastes prior to discharge via an NPDES outfall. There is also a land treatment unit for biodegradation of sludges generated at the refinery.

Chevron has submitted both the Part A notification and the Part B permit application in accordance with RCRA regulation for the land treatment unit, an induced air flotation pond and the flare oily basin.

This report is a review of solid waste management units at the Chevron U.S.A., Inc. Hawaiian Refinery. Primary sources of information used in this assessment included the RCRA and CERCLA files of the Environmental Protection Agency (EPA); the facility's RCRA Part B permit application; files of the Hawaii Department of Health Noise and Radiation, Environmental Permits, and Pollution Investigation and Enforcement Branches, and Chevron's solid waste management unit (SWMU) response letter. A visual site inspection (VSI) was conducted at the refinery on November 12-13, 1986 to verify the location and current disposition of SWMUs at the Chevron Hawaiian Refinery.

Section 2.0 describes the facility and its operations, Section 3.0 discusses the environmental setting, and Section 4.0 provides descriptions of individual SWMUs including wastes managed, history of releases, release controls, and potential for releases. Section 5.0 contains general conclusions from the assessment.

2.0 FACILITY DESCRIPTION

2.1 Facility Description

The Chevron U.S.A., Inc. Hawaiian Refinery is located within Campbell Industrial Park at 91-480 Malakole Road, Ewa Beach, Oahu, Hawaii. (Figure 1) The refinery began operation in 1960 (6,12).

The Chevron Hawaiian refinery processes about 50,000 barrels per day of low and medium sulfur crude oil. The refinery produces liquified petroleum gas, gasoline, jet fuel, diesel fuel, fuel oil, asphalt, and sulfuric acid. Figure 2 is a plot plan of the facility showing different processing and waste management units. Processing facilities at the refinery include a crude distillation unit, a catalytic cracking plant, an alkylation and isomeration unit, isomax hydrogenation and hydrogen plants, acid, amine, and acid storage plants, an asphalt plant, and a tank farm. The refinery also has office and laboratory facilities at this location.

Waste management at the site currently falls under two main categories, the wastewater treatment system and land treatment. Process wastewaters, surface run-off and other non-hazardous liquid wastestreams flow through enclosed pipe sewer systems to the wastewater treatment system. Oily wastewaters are first routed through the oily sewer to an API separator for oil and solids removal. Effluent from the API separator enters the south surge pond, which serves as an equalization basin to prevent surges through the oxidation ponds. Exchanger cleaning performed at the facility takes place at the exchanger location and wastes are discharged to the oily sewer.

Storm water runoff is transported through the storm sewer to the North Surge Pond, which also serves as an equalization basin upstream from the oxidation ponds.

Both surge ponds discharge to Oxidation Pond 1 for primarily biological oxidation enhanced by mechanical aerators. Additional biological oxidation takes place in Oxidation Pond 2/3.

Prior to discharge to the wastewater treatment system, potentially corrosive wastestreams are neutralized in a neutralization tank. Effluent from this unit is routed to a neutralization basin then to a settling basin for additional residence time.

Effluent from Oxidation Pond 2/3 flows to the Impounding Basin, the last surface impoundment prior to effluent being discharged to the ocean. The impounding basin allows additional settling of suspended solids and provides surge capacity from the rest of the wastewater treatment system.

Water destined for discharge through the NPDES outfall is routed to an induced air flotation (IAF) unit. This unit removes algae from the water to aid in compliance with the NPDES limit for total suspended solids. Algae, or IAF float, is routed to an IAF pond for dewatering. Water from the pond is sent to the outfall sump prior to discharge through an ocean diffuser offshore. (12,13)

The following SWMUs have been identified at the Chevron U.S.A. Hawaiian Refinery:

- Land Treatment Unit (Unit 4.1) (RCRA regulated)
- Inactive Land Treatment Area (Unit 4.2)
- API Separator (Unit 4.3)
- North Surge Pond (Unit 4.4)
- South Surge Pond (Unit 4.5)
- Oxidation Ponds (Unit 4.6)
- Neutralization Basin (Unit 4.7)
- Settling Basin (Unit 4.8)
- Impounding Basin (Unit 4.9)
- Outfall Sump (Unit 4.10)
- IAF Unit (Unit 4.11)
- IAF Pond (Unit 4.12) (RCRA regulated)
- Drum Storage Area (Unit 4.13)
- Flare Oily Basin (Unit 4.14) (RCRA regulated)
- Flare Lime Basin (Unit 4.15)
- Landfill A (Unit 4.16)
- Landfill B (Unit 4.17)
- Inactive Clay Dewatering Impoundment (Unit 4.18)
- Sewer Sludge Impoundment (Unit 4.19)
- Amine Washwater Impoundment (Unit 4.20)
- LPG Area Cooling Water Pond (Unit 4.21)
- South Ocean Pond (Unit 4.22)
- North Ocean Pond (Unit 4.23)
- Waste Pile A (Unit 4.24)

- Waste Pile B (Unit 4.25)
- Waste Pile C (Unit 4.26)
- Foul/Sour Water Tanks 303 and 304 (Unit 4.27)
- Foul Water Oxidizer (Unit 4.28)
- Weak Acid Neutralization Sump (Unit 4.29)
- Strong Acid Neutralization Sump (Unit 4.30)
- Alkylation Plant Neutralization Sump (Unit 4.31)
- Storm Water Drainage Swale and Culvert (Unit 4.32)
- Clay Dewatering Basin (Unit 4.33)
- Oil Recovery Box (Unit 4.34)
- Oily Sewer System (Unit 4.35)
- Acid Sewer System (Unit 4.36)
- Storm Bay and Storm Sewer (Unit 4.37)

2.2 Operating Permits

Four surface impoundments and the land treatment unit at the Chevron Hawaiian Refinery are RCRA regulated. (12) The refinery is also regulated for air emissions by the Hawaii Dept. of Health, and for wastewater discharges under Permit No. HI0000329. The current NPDES permit was issued on March 15, 1983 and will expire on March 15, 1988.(15)

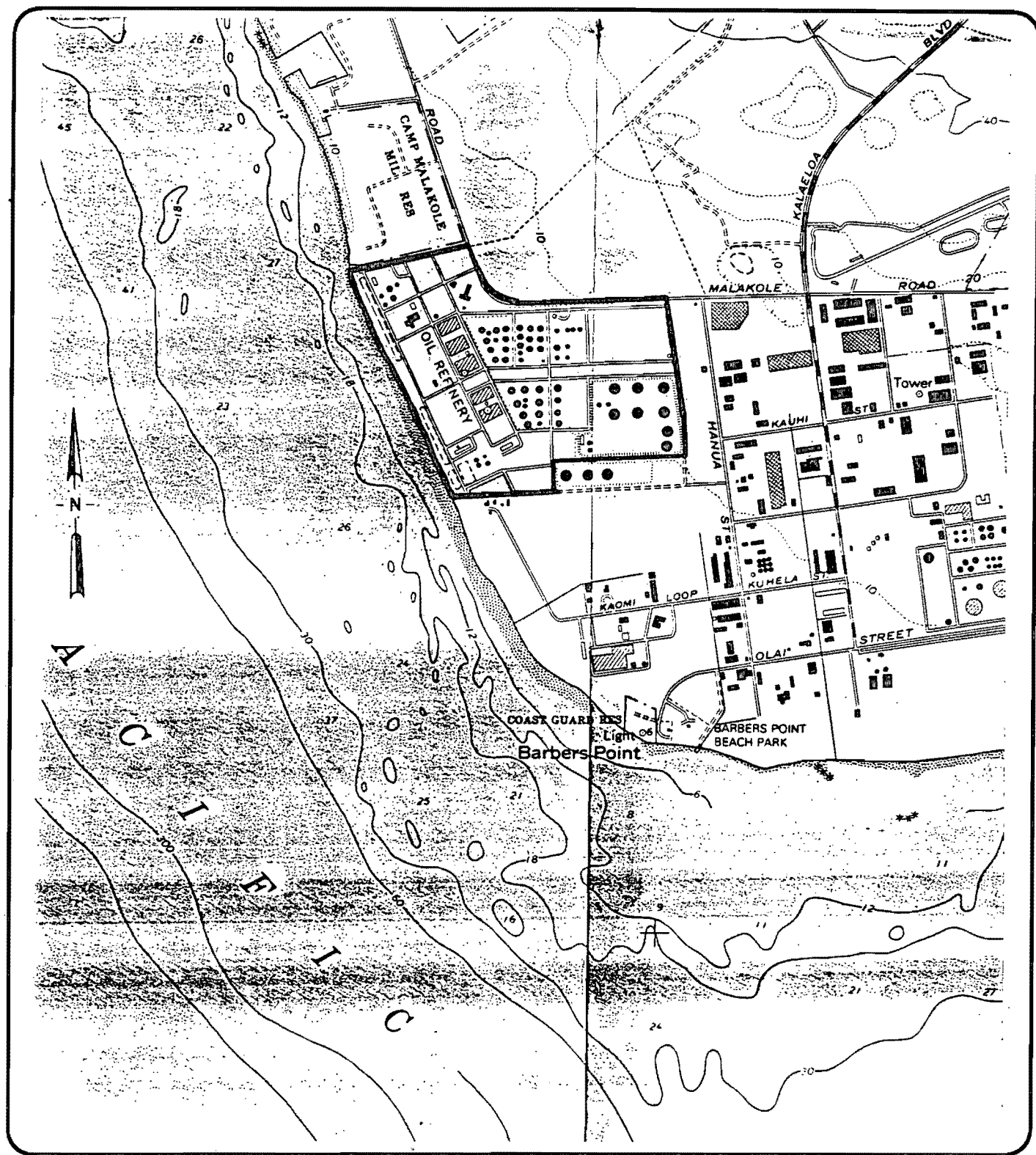


Figure 1

LOCATION OF CHEVRON USA HAWAIIAN REFINERY
Source: USGS Ewa Quad Topo. Map

3.0 ENVIRONMENTAL SETTING

3.1 LOCATION AND SURROUNDING LAND USE

The Chevron USA, Inc., Hawaiian Refinery is located in Campbell Industrial Park at Ewa Beach, Oahu, in the Barbers Point area. The facility is about 248 acres in size and the surrounding area is zoned for heavy industrial use.(12) The refinery is bounded on the west by the Pacific Ocean, on the south by Brewer Chemical, and on the north by Camp Malakole Military Reservation and vacant land. On the east side of the refinery lies a strip of vacant land bordered by other facilities within Campbell Industrial Park.

3.2 PHYSICAL GEOGRAPHY AND METEOROLOGY

The refinery is located on the Ewa Plain of southwestern Oahu. The plain is part of an emerged coral reef complex built on the edge of the Waianae Volcanic Range of western Oahu. The plain exhibits karst features.(12) A riprap sea wall protects the west side of the facility from high waves during storms.

The long term mean annual precipitation at the U.S. Magnetic Observatory nearby is 18.42 inches.(12) Daily maximum temperatures are in the high 70's in winter to the mid-80's in summer, with daily minimums from the mid-60's to the low 70's. The prevailing winds on Oahu are the northeasterly trade winds.(16)

3.3 GEOLOGY AND HYDROLOGY

The Waianae Range is constructed of thinly bedded basaltic lava estimated to be Miocene-Pliocene age. The coral reef complex was constructed during the Pleistocene age. The reef complex is composed of massive permeable coral reef deposits near the shoreline which interfinger both laterally and vertically with less permeable backreef lagoonal and alluvial deposits. The coral unconformably overlies basaltic lava flows of the Waianae Range. The reef is estimated to be approximately 600 feet thick beneath the Chevron site.(12)

A deep boring drilled by Dames and Moore in the adjacent proposed Conoco-Dillingham Refinery is believed to be representative of conditions beneath the Chevron site. The boring encountered 150 feet of a massive, extremely porous, friable coral with large solution cavities. The coral was underlain by sedimentary mud with coralline debris from 150 to 190 feet, mud from 240 to 270 feet, and coral from 270 feet to the end of the boring at 300 feet.(12)

There are two main aquifers in the Barbers Point area of Oahu. The upper aquifer is contained in the coral deposits, the lower one is contained within permeable sections of the Waianae volcanics. The basal volcanic aquifer contains a lens of fresh water floating on underlying salt water with a transition zone of brackish water between the fresh and salt groundwaters.

The coral aquifer is unconfined, brackish, and subject to tidal influence.(12) Beneath the Chevron refinery the water table is at a depth from ground surface of about 4 ft.(13) It is recharged from infiltration of rainfall and upward leakage from the underlying basal aquifer. Some local recharge may occur from irrigation return flows.(12)

The basal aquifer is confined by the lower permeability coral deposits above it, and the groundwaters in this aquifer exist under artesian conditions. Recharge is primarily from infiltration of rainfall on the Waianae Range.(12)

During the VSI, an excavation was observed near the drum storage area. The excavation exposed the water table, which was at a depth of about 4 feet and completely covered with floating oil. The excavation was originally made to work on some pipes, but has been converted to an oil recovery well used by Chevron to reclaim oil which has leaked from tanks at the refinery. A portable tank was located next to the excavation to contain oil pumped from the well. Chevron personnel reported that there are some 7 oil recovery wells at the Chevron Hawaiian refinery. The depth of the oil float on the water table could not be determined during the VSI. Chevron has also installed 45 "delineation wells" to identify the extent of the plume beneath the refinery. As of 1985, the plume extended from approximately the north property line near the tank farms at its northernmost point, south to the flare area. The plume at its easternmost point was detected between the jet fuel and bunker

tanks in the crude tank farm and at its westernmost point was detected around the drum storage area. The plume is near circular in shape. Any groundwater monitoring aimed at detecting releases from individual waste management units at the refinery is hampered by this extensive degradation of the upper aquifer.(13)

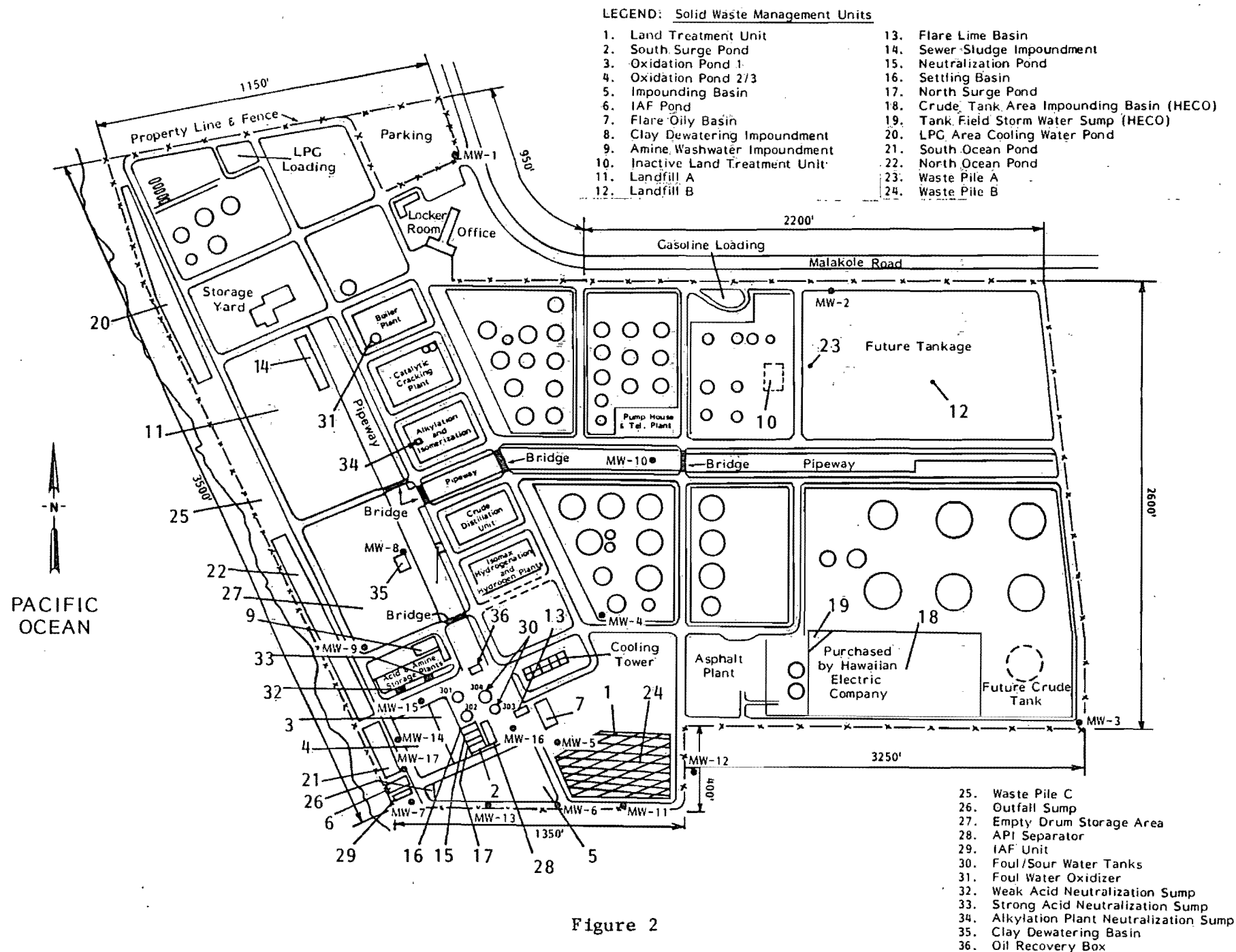


Figure 2

CHEVRON REFINERY LAYOUT

Source: RCRA Part B Permit Application, January 1985

4.0 DESCRIPTION OF INDIVIDUAL UNITS

4.1 LAND TREATMENT UNIT

4.1.1 Information Summary

Unit Description: The RCRA regulated land treatment unit covers 3.1 acres and consists of three cells with 6 foot berms of compacted coral.(6,9,13) It is constructed above ground and is unevenly pentagonal in shape.(13) Clean fill was brought to the site from an unrecorded location for use as treatment zone soil.(8,13) During the VSI, which took place after a heavy rain, there was some ponding of water in the treatment unit. Facility personnel estimated the depth of soil and treatment material to be about eight inches.(13) The treatment unit is equipped with a sprinkler system. Wastes in the unit are disked regularly to enhance biodegradation.(12)

Date of Startup: The unit was constructed in 1980.(3,12)

Date of Closure: This is an active unit.(12,13)

Wastes Managed: Wastes managed in the land application area include API separator sludge, non-leaded tank bottom sludges, IAF float, jet fuel filter media, oily soil, heat exchanger bundle cleaning sludge, column, exchanger, and vessel cleaning sludges, and pond sludges.(1,3,6,12) Chevron estimates about 110 tons of sludge are generated annually at the refinery.(12) Leaded tank bottoms which had been weathered elsewhere on site were placed in the treatment unit when it was first put into service.(13)

Release Controls: Three vacuum pressure cup type lysimeters are located within the treatment unit. One upgradient (MW-5) and three downgradient (MW-6, MW-11, and MW-12) groundwater monitoring wells have been installed near the treatment unit.(3,9,12) Wells are sampled for TOC, phenol, naphthalene, chromium (total and hexavalent), lead, mercury, arsenic, nitrate, silver, ammonia, and sulfide.(12)

History of Releases: Groundwater monitoring data presented in the facility's Part B permit application shows the presence of arsenic and lead in samples

collected from three downgradient wells (Wells 5, 6, and 11) during 1984. Neither compound was detected in samples from the upgradient well (Well 12) during the same period.(12) Chevron has attempted to draw liquid from the lysimeters on at least 11 occasions since 1981. Reportedly, only on 8/6/84 were samples able to be drawn from the lysimeters. At that time, soil analysis indicated the presence of low concentrations of chromium, copper, lead, nickel, and molybdenum.(12)

4.1.2 Conclusions

Groundwater Release Potential: Releases to groundwater may have occurred from this unit, based on groundwater data presented in the Part B permit application. Groundwater releases from this unit are regulated under RCRA.

Surface Water Release Potential: The land treatment unit is surrounded by six foot dikes constructed of crushed coral. No liquid wastes, only sludges, are placed in the unit. The potential for release from this unit is low.

Air Release Potential: There is potential for past and ongoing air releases of volatile constituents from this unit due to the application of oily sludges to soil in this unit and mechanical disking of the wastes.

Subsurface Gas Release Potential: If anaerobic decomposition of oily wastes occurs in this unit, there is a potential for the generation of methane, which may serve as a carrier for the volatile organic constituents present in the oily waste. The lack of unsaturated zone monitoring data prevents the determination of release potentials for other volatile organic constituents which may be present.

4.2 INACTIVE LAND TREATMENT AREA (Also known as Site X)

4.2.1 Information Summary

Unit Description: An area measuring approximately 50 feet by 70 feet was used as a weathering area for tank sludges. The area is located in the tank farm area in the northeast section of the property. The unit consists of an open area on bare ground within the three to four feet high berms of the tank farm.(5,13) Material was removed in 1980. It is unknown whether waste incorporation practices occurred while this unit was active.

Date of Startup: This site was put into use as a weathering area in the early 1960's.(13)

Date of Closure: The area was taken out of service in 1980, when the upper layers of material and some underlying coral were removed and placed in the current land treatment unit (Unit 4.1).(13) Samples of the remaining strata passed an EP Toxicity test, according to the facility, and thus were not removed.(5) This data was not available for review during the VSI. It is not known if any chemical analyses for hydrocarbons were performed on these samples.

Wastes Managed: Leaded tank bottoms were weathered in this area.(5) The quantity of wastes placed in this area during operation is not known. Tank bottoms are expected to contain polynuclear aromatic hydrocarbons as well as metals.

Release Controls: No known release controls were employed in this area while it was in use. The area is bermed by approximately three to four feet high berms of crushed coral construction.(13)

History of Releases: Leaded tank bottoms were applied to bare ground in this area. According to Chevron, samples of soil remaining in the area following removal of upper soil layers and sludges passed EP Toxicity tests.(5)

4.2.2 Conclusions

Groundwater Release Potential: There is a high potential that past releases of hazardous constituents to soil and groundwater, in particular lead, may have occurred from this unit. There may be potential for ongoing release of metals and hydrocarbons to groundwater from residual soil contamination. Although Chevron reports that remaining strata did not exhibit EP Toxicity characteristics, it is unknown if chemical analyses for hydrocarbons were performed.

Surface Water Release Potential: The weathering area is within a bermed tank farm area. There is no potential for release to surface water from this unit, as wastes have been removed and any runoff would be contained within the berm.

Air Release Potential: There is no potential for ongoing air releases from this unit, since all wastes have been removed. Air releases may have occurred while the unit was active.

Subsurface Gas Release Potential: If anaerobic decomposition of oily wastes has occurred in this unit, there is a potential for the generation of methane, which may serve as a carrier for the volatile organic constituents present in the oily waste.

4.3 API SEPARATOR

4.3.1 Information Summary

Unit Description: The API separator is 22 ft wide by 70 ft long by 6 ft high and is divided into two cells.(7) It is constructed of concrete and is entirely above ground. The API separator receives process wastewater and other oily waters from various refinery processes.(8) Oil from the separator is discharged to the recovered oil tanks and underflow is routed to the south surge pond (Unit 4.5).(7) During the VSI, cracks could be seen in the concrete and seepage of oily material was evident on the sides of this unit. A valve on the east side of the unit was oily and had dripped oily material onto the ground. Steam or vapors at the top of the south side of the separator were observed during the VSI.(13)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7,9,13)

Wastes Managed: The separator receives process wastewaters and other oily water from refinery operations which have been routed through the oily sewer system.(8) Results of chemical analyses on the API sludge are shown in Table 1.(9) The sludge is a defined hazardous waste, Waste No. K051.

Release Controls: According to Chevron, the separator is inspected weekly for evidence of leakage or cracking of the structure.(12) The unit sits directly on soil.(13)

History of Releases: There is no file evidence of release from this unit. The outside of the unit had oil along cracks in the side of the unit. Leakage of oily material was evident around the valves on the separator and had spilled to the ground on the east side of the separator. Steam or vapors could be seen coming from the south side of the separator.(13)

4.3.2 Conclusions

Groundwater Release Potential: Soil releases have occurred from this unit. Oily wastes which have seeped from the separator onto the ground could

Table 1

ANALYSES OF WASTES AND SLUDGES FROM CHEVRON HAWAIIAN REFINERY
FOR APPENDIX VIII CONSTITUENTS

Appendix VIII Constituents (ppm)	S. SURGE POND SLUDGE	OX 1 POND SLUDGE	OX 2/3 POND SLUDGE	IMFOUND. BASIN SLUDGE	FLARE OILY BASIN SLUDGE	API SLUDGE	OILY SLUDGES	IAF FLOAT	TANK BOTTOMS	JET CLAY	CAT FINES
Antimony	ND	ND	ND	ND	ND	8	ND	ND	ND	ND	ND
Arsenic	0.74	10.0	2.4	3.0	0.46	9.1	13	1.2	2.3	15	110
Barium	10	35	21	8.0	6.0	88	130	3.0	30	53	18
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8	0.6
Cadmium	0.7	1.5	1.6	ND	0.4	1.7	1.0	ND	0.4	1.0	ND
Chromium (Total)	9	221	337	75	11	37	75	4.8	39	45	24
Chromium (hexavalent)	0.08	0.66	3.8	1.2	ND	0.71	---	---	---	---	---
Lead	16	95	279	20	54	190	400	16	119	10	34
Mercury	0.60	0.46	0.38	0.38	0.66	1.7	0.02	0.06	0.06	0.14	ND
Nickel	9.6	24	30	14	8.0	56	48	5.0	15	12	200
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.2	1.1	0.8	ND	ND	0.4	0.4	ND	0.2	0.6	1.1
Vanadium	12	30	74	29	15	52	66	4.0	14	39	230
Organic Lead	0.4	6.2	5.9	0.2	1.6	1.6	12	ND	2.4	0.2	0.1
Benzene	37	ND	0.6	0.1	0.5	56	3.0	0.2	22	ND	ND
Toluene	78	ND	6	0.3	2	134	23	0.5	85	0.4	ND
1,1,1-trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
Phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	1.9	ND	ND	ND	ND	2	ND	ND	ND	1	ND
Cresol	4.0	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND
Napthalene	86	2	23	23	ND	46	169	ND	168	0.4	ND
Benzo(a)anthracene	ND	ND	1	ND	ND	ND	52	ND	80	ND	ND
Benzo(a)pyrene	3	ND	1	0.9	ND	ND	39	ND	79	ND	ND
Chrysene	2	5	2	3	20	14	125	ND	300	ND	ND
Flouranthene	ND	ND	ND	ND	ND	ND	4	ND	43	ND	ND
Benzo(b)flouranthene	ND	ND	ND	ND	ND	ND	6	ND	28	ND	ND
Benzo(j)flouranthene	ND	ND	ND	ND	ND	ND	10	ND	30	ND	ND
Flourine	92	6	5	ND	20	70	165	ND	120	ND	ND
para-1,4 dichlorobenzene	ND	ND	ND	0.9	ND	ND	ND	ND	ND	ND	ND
meta-1,3 dichlorobenzene	ND	ND	ND	14	ND	ND	ND	ND	ND	ND	ND
ortho-1,2 dichlorobenzene	ND	ND	ND	22	ND	ND	ND	ND	ND	ND	ND

eventually migrate to groundwater. There is an ongoing potential for soil and groundwater releases based on the condition of the unit observed during the VSI.

Surface Water Release Potential: There is a moderate potential that release of oily wastes to surface water could occur via runoff across plant property to the ocean southwest of the unit.

Air Release Potential: Air releases may be occurring via evaporation of volatile constituents that are present in oily wastewaters along the south side of the separator. The potential for past air releases cannot be determined.

Subsurface Gas Release Potential: This unit is constructed entirely above ground so there is no potential for subsurface gas generation.

4.4 NORTH SURGE POND

4.4.1 Information Summary

Unit Description: The north surge pond is located south of the neutralization pond. It has a capacity of 160,000 gallons, and measures 110 ft by 40 ft.(7) The depth of the pond could not be verified during the VSI or from blueprints provided by Chevron. It appears to be constructed mostly above grade. Crushed coral dike walls were approximately four feet in height. It is not lined.(8,13) Inflow to the pond is from the storm sewer (Unit 37). Effluent from this pond discharges to the oxidation ponds (Unit 4.6) It is not a RCRA regulated unit.(12) The pond was being operated with a little less than two feet of freeboard during the VSI. It contained water with some oil floating on the surface and some oily staining on the inside of the pond dike.(13)

Date of Startup: Unknown.

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond receives storm water runoff prior to its treatment in the oxidation ponds.(7) The stormwater runoff may contain hazardous constituents, especially aromatic hydrocarbons. No specific chemical analysis has been conducted of this liquid.

Release Controls: The pond is surrounded by approximately four foot crushed coral dikes. Oil float is skimmed manually and routed to the recovered oil tank and subsequently rerefined.(13) This pond, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: Soils composing the pond dikes were observed to be stained with hydrocarbon material from oily wastewaters in the pond during the VSI.

4.4.2 Conclusions

Groundwater Release Potential: Potential for past and ongoing releases of hydrocarbons to groundwater may exist for this unit. Oily staining of the dikes indicates a potential route for migration of hazardous constituents through soils to groundwater.

Surface Water Release Potential: There is no evidence of past overflow from this unit. The potential for release to surface water from this unit appears to be low based on the diking and freeboard observed during the VSI.

Air Release Potential: There is potential for ongoing air releases from this pond due to volatile constituents that may be present in oily float on the surface of the pond. The potential for past air releases is assumed to be similar.

Subsurface Gas Release Potential: If anaerobic decomposition of oily wastes occurs in this unit, there is a potential for the generation of methane, which may serve as a carrier for the volatile organic constituents present in the oily waste.

4.5 SOUTH SURGE POND

4.5.1 Information Summary

Unit Description: The south surge pond is an unlined 0.16 acre surface impoundment which is used as an equalization basin.(8) It is located adjacent to the north surge pond (Unit 4.4), sharing a common dike wall with that pond. The depth of the pond could not be verified during the VSI or from blueprints provided by Chevron. Pond dikes are of crushed coral construction, and are about four feet high. The pond is equipped with a concrete oil collection box at its northwest end. Hand skimmers are used to collect oily float off the pond. Effluent from the pond discharges to the oxidation ponds (Unit 4.6) The pond contained water with a thick oily scum, and was being operated with between 8 inches and two feet of freeboard at the time of the VSI. A heavy hydrocarbon odor was noticeable in the area during the VSI, but it could not be determined if the pond was the source of these odors.(13)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(8)

Wastes Managed: The pond receives effluent from the API separator.(8,12) Results of chemical analyses on pond sludges are shown in Table 1.(9) The sludges contain various metals as well as benzene, toluene, phenols, naphthalene, and other organic Appendix VIII constituents.

Release Controls: Chevron reports that the pond is inspected to ensure that two feet of freeboard are maintained at all times.(12) However, the pond was being operated with less than two feet of freeboard during the VSI.(13) This pond, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (MW-13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: Available groundwater monitoring data do not indicate release from this unit. No evidence of overflow was observed during the VSI. However, the pond dikes were covered with oily stains.

4.5.2 Conclusions:

Groundwater Release Potential: There is potential for past and ongoing releases of hazardous constituents from this unit, in particular hydrocarbons. Oily staining of the insides of the pond dikes indicate a possible migration route from the soil to groundwater.

Surface Water Release Potential: The pond was being operated with less than two feet of freeboard during the VSI, which was conducted following a heavy rainfall. There may be potential for releases to surface water if the pond were to overflow.

Air Release Potential: There is potential for past and ongoing air releases from this unit as the pond is covered with oil which may contain volatile components.

Subsurface Gas Release Potential: If anaerobic decomposition of oily wastes occurs in this unit, there is a potential for the generation of methane, which may serve as a carrier for the volatile organic constituents present in the oily waste.

4.6 OXIDATION PONDS

4.6.1 Information Summary

Unit Description: There are two mechanically aerated oxidation ponds on the Chevron Hawaiian Refinery site.(8) They are lined only with compacted coral (6,13) Oxidation Pond 1 is 0.7 acre in size and contains three barge-mounted floating aerators. Oxidation Pond 2/3 covers 1.26 acres and consists of two ponds separated by a curtain wall, with each section being served by two floating mechanical aerators.(8,12,13) The exact depth of the ponds could not be determined during the VSI or from blueprints provided by Chevron. The pond dikes are approximately four feet in height and are constructed of crushed coral. A plastic material has been used on pond dikes for stability purposes, however, it appeared to have broken loose and could be seen floating along the pond edges.(13) These ponds are not RCRA regulated.(13) Effluent from Oxidation Pond 2/3 goes to the impounding basin (Unit 4.9).

Date of Startup: Unknown.

Date of Closure: The ponds are active units.(9)

Wastes Managed: Effluent from the north and south surge ponds discharges into the oxidation ponds. The effluent contain phenols, oil sulfides and ammonia. (8) The results of pond sludge chemical analyses are shown in Table 1.(9) Although Chevron has disputed it, EPA considers the pond sludges to be a listed hazardous waste due to their similarity with API separator sludges.(12)

Release Controls: According to Chevron, the ponds are inspected daily to verify that there is a minimum two feet of freeboard.(9,12) The overflow weir and sluice valve are reportedly inspected weekly. During the VSI, the oxidation ponds were being operated with about 1.5 to 2 feet of freeboard. A plastic material has been used on the pond dikes for stability purposes. This material was not anchored adequately and could be seen floating in some areas at the pond surface near the dikes.(13) The ponds are not lined. These ponds, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: There is no file evidence of release from the ponds. There were no signs of overflow at the oxidation ponds during the VSI. There was some oily staining inside the pond dikes.(13) No odors were noted during the VSI.

4.6.2 Conclusions

Groundwater Release Potential: The potential exists for past and ongoing releases to soil and groundwater from this unit due to the absence of any liner and the presence of hazardous constituents in the effluent.

Surface Water Release Potential: The ponds were being operated with less than two feet of freeboard. There is potential for release to surface water if the ponds overflowed. Potential for overflow in these ponds is somewhat greater than for other ponds at the facility due to the agitating action of the aerators.

Air Release Potential: There is potential for past and ongoing air releases of any hazardous constituents which may be present in the wastewaters treated in the ponds. The aerating action of the ponds would enhance the release of volatile constituents in the pond effluent.

Subsurface Gas Release Potential: Because the ponds are not lined, and if they are not continuously and adequately aerated, there is a potential for past and ongoing generation of subsurface gases at the bottom of the ponds.

4.7 NEUTRALIZATION BASIN

4.7.1 Information Summary

Unit Description: The neutralization basin is located between the settling basin and the north surge pond. It measures 110 ft by 40 ft and has a capacity of 160,000 gallons.(7) The basin reportedly may have a concrete base, however this could not be confirmed during the VSI.(13) The exact depth of the basin could not be determined during the VSI or from blueprints provided by Chevron. The basin dikes are constructed of crushed coral and rise approximately four feet above ground level. Overflow from the basin goes to the settling basin (Unit 4.8).(13) At the time of the VSI, the basin contained liquid with about two feet of freeboard. Some white crusted material of unknown composition was visible on the inside dike walls. Some steam or other vapor was observed rising from the basin during the VSI.(13)

Date of Startup: The basin was put into operation in the early 1960's.(13)

Date of Closure: The basin is an active unit.(7)

Wastes Managed: The basin receives potentially corrosive waste streams from refinery operating units neutralization sumps and the acid sewer (Units 4.30, 4.31, 4.32, and 4.33?). Low pH waste streams are mixed with lime slurry in the basin for neutralization to a pH between 6.0 and 8.0.(7) No chemical analysis for hazardous constituents in the waste streams entering this basin has been performed.

Release Controls: The basin may have a concrete base, although this has not yet been confirmed by Chevron. The basin has approximately 4 foot dikes constructed of compacted coral.(13) This pond, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (13,14,15,16,17). The location of these wells is shown in Figure 2.

History of Releases: Chevron does not report any releases from this unit. No evidence of overflow was observed during the VSI.(13)

4.7.2 Conclusions

Groundwater Release Potential: It is not known whether the waste streams entering the basin contain hazardous constituents. Nor has it been confirmed whether the basin has a concrete bottom. If hazardous constituents are present, there is potential for their release to soil and groundwater from this unit because the basin walls are unlined.

Surface Water Release Potential: There was no evidence of overflow at the basin during the VSI and it was being operated with about two feet of freeboard. The potential for past and ongoing release to surface water is believed to be low from this unit.

Air Release Potential: There is potential for past and ongoing air releases from this unit if hazardous constituents are present.

Subsurface Gas Release Potential: Due to the nature of this unit, there is no potential for subsurface gas generation.

4.8 SETTLING BASIN

4.8.1 Information Summary

Unit Description: The settling basin is located north of the neutralization basin, and measures 110 ft by 40 ft with a capacity of 160,000 gallons.(7) The basin shares a common wall with the neutralization basin to the south. Basin dikes are constructed of crushed coral and rise about four feet above ground. The exact depth of the basin could not be determined during the VSI or from blueprints provided by Chevron. Effluent from the settling basin goes to the impounding basin. Sludge from the settling basin is dredged and placed in the flare lime basin (Unit 4.13) The basin was being operated with approximately 2 feet of freeboard at the time of the VSI.(13)

Date of Startup: The basin was put into service in the early 1960's.(13)

Date of Closure: This is an active unit.(7)

Wastes Managed: The settling basin receives neutralized effluent from the neutralization pond. Its purpose is to provide additional residence time for lime solids to settle out.(7) Sludge from the settling basin is dredged and placed in the flare lime pit.(13)

Release Controls: The basin is unlined and constructed of crushed coral with approximately 4 ft dikes. This pond, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: Chevron has not reported any releases from the basin and no visible signs of overflow were noted during the VSI.

4.8.2 Conclusions

Groundwater Release Potential: It is unknown if effluent entering the pond contains hazardous constituents. If it does, there may be potential for release of these constituents to soil and groundwater due to the absence of any pond liner.

Surface Water Release Potential: There was no evidence of overflow at the basin during the VSI, and the pond was being operated with about two feet of freeboard. The potential for past and ongoing release to surface water appears to be low.

Air Release Potential: Because the basin is open to the air, if hazardous constituents are present in the basin effluent, there is potential for air releases.

Subsurface Gas Release Potential: Due to the nature of this unit, there is no potential for generation of subsurface gases.

4.9 IMPOUNDING BASIN

4.9.1 Information Summary

Unit Description: The impounding basin is a 2.3 acre impoundment used as a settling basin, receiving wastewater from the oxidation ponds, the settling basin, cooling tower blowdown, IAF pond effluent, and any overflow from the flare oily basin. It has an estimated depth of 10 to 12 feet. The basin was constructed by excavating below grade in weathered coral. It is not lined.(13) Effluent from the basin flows to an induced air flotation (IAF) unit for algae removal.(8)

Date of Startup: The basin was put into operation in about 1960.(13)

Date of Closure: This is an active unit.(8)

Wastes Managed: The impounding basin receives effluent from Oxidation Pond 2/3 (Unit 4.6), settling basin effluent (Unit 4.8), the IAF pond (Unit 4.12), cooling tower blowdown, and any overflow from the flare oily basin (Unit 4.4.14).(8,12,13) Results of basin sludge analyses are shown in Table 1.(9) Effluent from the basin has not been fully characterized chemically to provide sufficient data concerning the presence of hazardous constituents. The basin serves two functions: allowing additional settling of suspended solids, and providing surge capacity for the wastewater treatment system.(12)

Release Controls: According to Chevron, the impounding basin is inspected regularly to ensure that it is in good operating condition and that two feet of freeboard are maintained.(9,12) During the VSI, it was noted that coral dikes surrounding the basin were six inches to one foot above surrounding ground level.(13) This basin, along with the other ponds in the waste water treatment system are monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: There is no file evidence of release from this unit. Although there was no evidence of actual overflow during the VSI, which took place after a heavy rainfall, basin freeboards ranged from only about 2 inches in some sections of the basin to about two feet in others.

4.9.2 Conclusions

Groundwater Release Potential: The basin is unlined and is likely to have been excavated below the water table, therefore there is a high likelihood for past and ongoing release of hazardous constituents to soil and groundwater.

Surface Water Release Potential: The basin was being operated with almost no freeboard during the VSI, which took place after a heavy rain, and was near overflow. If hazardous constituents are present in the basin effluent there is potential for release to surface water.

Air Release Potential: If hazardous constituents are present in the basin effluent, there is potential for their release to air.

Subsurface Gas Release Potential: Due to the nature of this unit and the wastes it received, there is no potential for generation of subsurface gas.

4.10 OUTFALL SUMP

4.10.1 Information Summary

Unit Description: The outfall sump is located at the far west corner of the impounding basin. Like the impounding basin, the outfall sump was excavated below grade in coral, and has approximately 1 to 1.5 foot high berms. The depth of the sump could not be verified during the VSI or from blueprints provided by Chevron. It is separated from the impounding basin by a concrete wall. The sump receives effluent from the IAF unit and once through brine water from the acid plant.(13) The outfall sump discharges through an NPDES regulated ocean diffuser offshore in the Pacific Ocean west of the refinery.

Date of Startup: Unknown.

Date of Closure: This is an active unit.(13)

Wastes Managed: The outfall sump receives effluent from the IAF unit and once through brine water from the acid plant. No chemical analysis data were available to determine the presence or concentration of hazardous constituents in the sump effluent. However, NPDES discharge from this unit sets limits and/or requires monitoring for chromium, ammonia, oil and grease, phenol, sulfides, and TOC.(15)

Release Controls: The sump is not lined. It is surrounded by low coral berms about 1 to 1.5 feet in height. The sump, along with the other ponds in the waste water treatment system is monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: There is no file evidence of release from this unit. There were no visible signs of overflow from the unit during the VSI.(13)

4.10.2 Conclusions

Groundwater Release Potential: If hazardous constituents are present in the effluent in the sump, there is potential for releases to soil and groundwater from this unlined unit.

Surface Water Release Potential: Releases to surface water from this unit are regulated under NPDES permit. There is no apparent potential for unregulated releases to surface water.

Air Release Potential: Due to the open construction of the sump there may be potential for releases to air if hazardous constituents are present.

Subsurface Gas Release Potential: Due to the nature of the wastes in this unit, there is no potential for subsurface gas generation.

4.11 INDUCED AIR FLOTATION UNIT

4.11.1 Information Summary

Unit Description: The induced air flotation (IAF) unit is located in the southwest corner of the refinery approximately 100 feet inland from the Pacific Ocean. The unit sits on a concrete pad, is about 40 ft long, 10 ft wide and 8 ft deep. The walls and roof of the unit are also constructed of concrete and appear to be in good condition.(13) The base of the unit sits at about 6 feet above ground level to take advantage of gravity feed into the IAF pond (Unit 4.11), to which solids from the IAF unit are discharged.(13)

Effluent from the impounding basin (Unit 4.9) is pumped to the IAF unit. Flocculating chemicals are added at the transfer pump. Treated IAF effluent is withdrawn and pumped to the outfall sump. A fraction of this effluent is recycled back to the IAF unit and discharged through spray nozzles at the top of the unit to aerate the liquid. Paddles continuously skim the float from the unit and discharge it to the IAF pond (Unit 4.11) for dewatering.

The primary function of this IAF unit is to remove algae from impounding basin effluent to enable Chevron to meet the total suspended solids limit in the facility's NPDES permit. According to Chevron, the IAF unit is exempt from RCRA regulation since it meets the definition of a tank and it is part of an Effluent Water Treatment System regulated under Section 402 of the Clean Water Act.(12)

Date of Startup: The IAF unit was put into service in about 1980.(13)

Date of Closure: This is an active unit.(8,13)

Wastes Managed: The IAF unit receives Oxidation Pond 2/3 effluent, settling basin effluent, and cooling tower blowdown which have undergone settling in the impounding basin.(8,9) Analyses of IAF sludges have shown that there is some benzene and toluene in the IAF float.(9)

Release Controls: According to Chevron, the unit is inspected regularly to ensure proper operational condition.(12)

History of Releases: There are no visible signs of spills or leaks at this unit. No evidence of hydrocarbons in the water in this unit could be detected by sight or smell during the VSI.(13)

4.11.2 Conclusions

Groundwater Release Potential: There are no signs of leaks or spills and no record of past releases from the IAF unit. Therefore, the potential for groundwater release is low.

Surface Water Release Potential: Due to the nature of this unit the potential for surface water release is minimal.

Air Release Potential: Analyses of IAF float material showed the presence of benzene and toluene. Although these volatile components are constituents of wastes in the unit, it is likely that they are bound to organic solids and not available for volatilization.

Subsurface Gas Release Potential: This unit is constructed entirely above ground, so there is no potential for subsurface gas generation.

4.12 INDUCED AIR FLOTATION POND

4.12.1 Information Summary

Unit Description: The RCRA regulated IAF pond is located at the southwest corner of the refinery immediately north of the IAF unit and adjacent to the south ocean pond. It is 11 ft wide by 52 ft long and 6 ft high.(7) The pond is not lined. The pond bottom sits approximately at grade and the dikes are of coral construction. The pond is equipped with an overflow gate to the south ocean pond (Unit 4.22). Pond levels during the VSI, which occurred after a heavy rain, were within two to three inches of the overflow gate. Green scum was visible below the overflow trough on the south ocean pond side of the dike, indicating potential seepage.(13) The west half of the pond was covered with a green scum with a strong biological odor. The western exterior dike wall showed signs of erosion. Chevron has intends to close the pond as soon as the refinery's RCRA permit is approved.(13)

Date of Startup: The unit was placed in service in about 1980.(13)

Date of Closure: This is an active unit, although Chevron intends to close it as soon as it receives its RCRA permit.(7,13)

Wastes Managed: The IAF pond receives float from the IAF unit and partially dewateres it. Results of analyses on the IAF float are shown in Table 1.(9) Decanted effluent is directed into the impounding basin.(8) Pond float and sludges are manually removed and hauled to the land treatment unit (Unit 4.1). Chevron uses a backhoe to dredge the pond about four times per year.(13)

Release Controls: According to Chevron, pond levels are checked daily to ensure that two feet of freeboard are maintained at all times. However, during the VSI, there was less than one foot of freeboard.(12,13) The pond is equipped with an overflow gate to the south ocean pond.(13)

History of Releases: No visible signs of pond overflows were noted during the VSI. Scum on the south ocean pond side of the dike indicated potential seepage from the IAF unit.

4.12.2 Conclusions

Groundwater Release Potential: Groundwater releases from this unit are regulated under RCRA authority. However, there is no groundwater monitoring well downgradient of this unit. The IAF float contains small concentrations of seven Appendix VIII metals, benzene, and toluene. Due to the lack of a liner in the pond, there is a potential for release to soil and groundwater from this unit. Metal constituents may be attenuated by carbonates in the underlying coral substrate. It is likely that the organic constituents are present in association with biological solids, making them less available for migration.

Surface Water Release Potential: The pond is equipped with an overflow gate to the south ocean pond, so release to surface water by overflow is considered unlikely. Pond dikes were eroded on the west side of the pond and possible seepage around the overflow gate connecting it with the south ocean pond was visible during the VSI, so there may be potential for release through seepage through the dikes or from dike failure.

Air Release Potential: The IAF float which is discharged to the pond contains 0.2 ppm benzene, 0.5 ppm toluene, and 1 ppm carbon disulfide, indicating there may be potential for release of these volatile organic chemicals via air. If these constituents are bound up in biological solids, as is likely, they will be less likely to volatilize.

Subsurface Gas Release Potential: Due to the above ground construction of this unit, there is no potential for subsurface gas generation.

4.13 DRUM STORAGE AREA

4.13.1 Information Summary

Unit Description: The drum storage area is located east of the north ocean pond. It is located on flat bare ground and covers an area of about 50 by 100 feet. During the VSI, which was conducted following a heavy rain, there was considerable ponding of water in the area.(7,13) Some drums are stored on pallets, but not all.(13) The area is used mostly for empty drum storage, although a few drums containing products were also observed in the storage area.(13) The length of time the drums have stored here is not known. Many of the drums were rusty and in poor condition.(13)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7)

Wastes Managed: Wastes observed in this area during the VSI included empty lubricating oil and chemical drums which are being accumulated until they are shipped off-site for recycling. The area also contained some nearly full, open-topped product drums, some containing bleach and others containing a fine whitish crystalline substance, one labeled "Nalco," the other labeled "W.R. Grace Additive." Other than the manufacturer's name, the labels were not legible on these drums. Other empty drums were labeled as having contained methanol, acetone, Chloroethene (1,1,1-trichloroethylene), and propylene dichloride.(13)

Release Controls: There are no release controls in the drum area. Drums are stored on bare ground. Precipitation ponds in this area and does not runoff.(13)

History of Releases: A 1986 RCRA TSD investigation noted chemical stains on the ground next to rows of drums in the storage area.(11) During the VSI some red stained soil was noted in the area, there was also a red oily substances floating on ponded water around some of the drums. One area of ground near an open-topped drum containing two to three inches of oil was stained with oil.(13) The stained area measured approximately 2 by 3 ft.(13)

4.13.2 Conclusions

Groundwater Release Potential: Staining of soil in the drum storage area indicates that releases of hazardous constituents to soil may have occurred, and that there is also potential for past and ongoing release to groundwater.

Surface Water Release Potential: The drum storage area is located in a flat area about 100 yards from the Pacific Ocean. However, drainage patterns in the vicinity did not indicate that any runoff would enter surface water.

Air Release Potential: There is potential for ongoing air releases in the drum storage area from open drums and from leaks in drums which may contain small amounts of chemicals.

Subsurface Gas Release Potential: Although this unit is located entirely above ground, leaking drums which may contain TCE may cause a potential for subsurface gas generation.

4.14 FLARE OILY BASIN

4.14.1 Information Summary

Unit Description: The flare oily basin, a RCRA regulated unit, has 0.24 acres in surface area.(9) It has approximate dimensions of 40 ft by 150 ft. The exact depth of the unit could not be determined during the VSI or from blueprints provided by Chevron. Six foot dikes surrounding the basin are constructed of crushed coral. The basin is not lined. It is located east of the flare lime basin.(13)

Date of Startup: The exact date of startup is unknown. It is estimated that the basin was put into service sometime in the early 1970's.(13)

Date of Closure: According to a December, 1985 inspection and to Chevron, this unit is no longer in use and will undergo closure.(10,13) During the VSI, Chevron personnel stated that the basin is no longer used on a regular basis, however it did receive some API sludge at one time during 1986.(13)

Wastes Managed: This basin receives oily skimmings from the oxidation ponds and other oily wastes, such as oil spill material.(2,9) API separator sludge may also have been placed in the basin.(9) Analysis of sludge from the flare oily basin detected toluene at 2 ppm, chrysene at 20 ppm, and fluorene at 20 ppm. Appendix VIII metals were below Total Threshold Limit Concentrations (TTLC).(9) Results of analyses are shown in Table 1.(9)

Release Controls: The basin is constructed only of compacted coral dikes and is unlined. It is equipped with an overflow pipe connected to the impounding basin.(13) This basin, along with the other ponds in the waste water treatment system is monitored using five groundwater monitoring wells (13, 14, 15, 16, 17). The location of these wells is shown in Figure 2.

History of Releases: It is unknown whether releases have occurred from this unit.

4.14.2 Conclusions

Groundwater Release Potential: Releases to groundwater from this unit are regulated under RCRA authority. There is potential for past and ongoing release of hazardous constituents from this unit due to the unlined construction of the pond and the presence of hazardous constituents in wastes which have been placed in the basin.

Surface Water Release Potential: There was no visual evidence of overflow at the basin. Potential for releases to surface water is low.

Air Release Potential: There is potential for air release from this unit due to the presence of wastes with volatile constituents.

Subsurface Gas Release Potential: Due to the above ground construction of this unit, there is no potential for subsurface gas generation.

4.15 FLARE LIME BASIN

4.15.1 Information Summary

Unit Description: The basin is located east of the API separator and south of the cooling tower, and measures 110 ft by 80 ft with a capacity of 350,000 gallons.(7) The exact depth of the basin could not be verified during the VSI, but Chevron personnel estimate its depth at about 12 feet, making it partially above grade and partially below grade. It is surrounded by 6 foot dikes of crushed coral. It is not a RCRA regulated unit.(2) During the VSI the basin contained an estimated 12 feet of dry lime solids with no standing liquids and no evidence of seepage in the dikes.(13) When the sludge fills the basin, it is cleaned out by an outside contractor. The exact date of the last cleanout is not known.(13) Lime sludges are then sent to a municipal landfill for disposal.

Date of Startup: The basin is believed to have been put into operation when the refinery was started up in 1960.(13)

Date of Closure: The basin is an active unit.(7)

Wastes Managed: The basin is used to dry alkaline lime sludge that has been removed from the acid/amine/boiler blowdown neutralization ponds.(2) It is unknown whether the lime contains hazardous constituents.

Release Controls: The basin is surrounded by six foot coral dikes. It is not lined.(13)

History of Releases: A 1986 RCRA TSD investigation noted that the basin was leaking along the side of its dike. No samples were taken during this inspection.(11) No evidence of overflow or seepage was noted during the VSI.(13)

4.15.2 Conclusions

Groundwater Release Potential: It is unknown if there are leachable hazardous constituents in the lime sludge. If so, there may be potential for releases to groundwater from this unlined unit.

Surface Water Release Potential: There were no signs of overflow from this unit during the VSI. The potential for releases to surface water is considered low.

Air Release Potential: The basin was dry at the time of the VSI. If any hazardous constituents are present in the lime, there may be potential for air releases via windborne particulates.

Subsurface Gas Release Potential: Due to the nature of this unit and the inorganic nature of the wastes it receives, there is no potential for subsurface gas generation.

4.16 LANDFILL A

4.16.1 Information Summary

Unit Description: Landfill A is located south of the liquefied petroleum gas area. Its exact dimensions and capacity were stated to be unknown in the facility's SWMU response letter.(7) As observed during the VSI, the landfill is in a grassy area where water was ponded due to recent heavy rains. No wastes were visible on the ground surface.(13)

Date of Startup: Unknown.

Date of Closure: The landfill was taken out of service and the area regraded in 1984 ground surface.(7)

Wastes Managed: Wastes placed in the landfill included fluid catalytic cracker catalyst fines (regenerated), clay treater spent clay, and lime blowdown from freshwater treating at the refinery.(7) The catalyst fines contain arsenic, barium, beryllium, trivalent chromium, lead (including organic lead), nickel, silver, and vanadium.(9) According to Chevron, the catalyst fines do not exhibit EP Toxicity characteristics. The jet filter clay contains these constituents and also cadmium and mercury. Both the catalyst fines and the jet filter clay contain some Appendix VIII volatile and semivolatile organic constituents. Results of chemical analyses of these wastes are shown in Table 1.(9)

Release Controls: There are no known release controls associated with this landfill.

History of Releases: There is no file evidence of release from this unit. Water was ponded on the surface of the landfilled area during the VSI.

4.16.2 Conclusions

Groundwater Release Potential: There is potential for past and ongoing release of hazardous constituents to groundwater from this unit due to the presence of Appendix VIII constituents in wastes placed in this area.

Surface Water Release Potential: Wastes have been covered and the landfill is located in a flat area of the refinery with no discernible runoff. Therefore, potential for release to surface water is believed low. Wastes were placed below grade, so potential for past release to surface water is low.

Air Release Potential: Wastes have been covered, therefore there is no potential for ongoing air releases. There was a potential for releases to air of volatile and nonvolatile constituents before the landfill was covered.

Subsurface Gas Release Potential: Although the unit is not known to have received putrescible organic wastes, it is likely that hydrocarbons contained in the jet fuel filter clay may break down. This may cause the generation of subsurface gases, including methane and some volatile Appendix VIII constituents.

4.17 LANDFILL B

4.17.1 Information Summary

Unit Description: Landfill B is located in the northwest section of the plant property east of the tank farms and in a clearing about one acre in size surrounded by kiawe brush. Although it had been described as a landfill by Chevron, it is more accurately described as a wastepile.(7)

Date of Startup: 1978.(7)

Date of Closure: No disposal has taken place in this area since 1982.(7)

Wastes Managed: Landfill B was used to dispose of various materials, including trees cleared from the site, asphalt and dirt from asphalt spill cleanup, and an asphalt roof which was damaged during a 1981 hurricane.(7,13) No solid wastes containing hazardous constituents are known to have been disposed in this unit.

Release Controls: There are no release controls associated with this unit.

History of Releases: No solid wastes containing hazardous constituents are known to have been disposed in this area; therefore, no releases have occurred from this unit.

4.17.2 Conclusions

Groundwater Release Potential: No hazardous constituents were disposed in this area. Wastes consist of wood and building debris. There is no potential for releases of hazardous constituents to groundwater.

Surface Water Release Potential: There are no hazardous constituents associated with this landfill, so there is no potential for releases to surface water.

Air Release Potential: There are no hazardous constituents in this unit, therefore there is no potential for releases of hazardous constituents to air.

Subsurface Gas Release Potential: All wastes disposed in this area are above ground, and no putrescible wastes were placed here. There is no potential for subsurface gas generation from this unit.

4.18 INACTIVE CLAY DEWATERING IMPOUNDMENT

4.18.1 Information Summary

Unit Description: This impoundment measured 45 ft x 80 ft, and was located west of the crude distillation unit and the clay dewatering basin. It had a capacity of about 50,000 gallons.(7) No other information is available on its construction is available. The area as observed during the VSI is a grassy field with no sign of waste disposal.(13)

Date of Startup: Unknown.

Date of Closure: The clay and some surrounding soil were removed in 1982.(7) It is not known if sampling criteria were used for soil removal during the impoundment closure.

Wastes Managed: Spent jet fuel filter clay was dewatered and weathered at this site a few times prior to 1980.(7) The clay contains some Appendix VIII metals and toluene has been detected in spent clay samples. Results of chemical analyses of these wastes is presented in Table 1.(9)

Release Controls: No known release controls existed for this unit.

History of Releases: The facility does not report any releases from this unit.

4.18.2 Conclusions

Groundwater Release Potential: Releases to soil and groundwater may have occurred while the impoundment was in use. Wastes and some soil were removed in 1982, reducing but not eliminating the potential for ongoing releases to groundwater. However, it is not known if the waste and soil removal was extensive enough to remove all contaminated material. No sign of releases to soil were visible in the impoundment area during the VSI.

Surface Water Release Potential: The impoundment was located in an area with flat topography, making it unlikely that releases to surface water have occurred. There is no ongoing potential for release to surface water.

Air Release Potential: There is a potential for past air releases from this unit due to the presence of toluene. Since the clay wastes and some soil have been removed, the potential for ongoing releases to air are considered low.

Subsurface Gas Release Potential: If wastes in this unit were to break down under anaerobic conditions, methane may be generated. If this occurs, the methane may serve as a carrier for volatile organic constituents contained in the jet fuel filter clay.

4.19 SEWER SLUDGE IMPOUNDMENT

4.19.1 Information Summary

Unit Description: The sewer sludge impoundment was located south of the clay dewatering impoundment. Its dimensions were 100 ft. by 60 ft, with a capacity of 100,000 gallons.(7) The area has been filled and regraded to ground level.(13) The impoundment now appears as a sandy area.(13)

Date of Startup: Unknown.

Date of Closure: Sludge and some soil were removed to the land treatment unit and the area was then regraded in 1982.(7) It is unknown what criteria were used for removal of soils during the impoundment's closure.

Wastes Managed: Wastes placed in this impoundment included amine column and vessel sludges and wash water.(7) No known hazardous constituents were present in the wastes placed here.

Release Controls: It is unknown whether release controls exist for this unit. However, it is unlikely that the impoundment was lined.

History of Releases: There is no file evidence of release from this unit. No evidence of release was observed during the VSI.

4.19.2 Conclusions

Groundwater Release Potential: Wastes in this unit are not believed to have contained hazardous constituents, therefore there is no potential for past or ongoing releases to soil or groundwater.

Surface Water Release Potential: There is no potential for past or ongoing releases to surface water from this unit.

Air Release Potential: There is no potential for past or ongoing releases to air cannot be determined.

Subsurface Gas Release Potential: Due to the fact this unit was an impoundment, there is no potential for generation of subsurface gases.

4.20 AMINE WASHWATER IMPOUNDMENT

4.20.1 Information Summary

Unit Description: The impoundment measured 100 ft by 60 ft and had a capacity of 100,000 gallons.(7) It was located north of the amine plant, in the southwest quadrant of the refinery.(7,13) It was filled and regraded after its closure in 1982.(7,13) The amine washwater impoundment was used only during amine plant turnaround under supervision of refinery personnel.(7) It now appears as an area of bare ground adjacent to the amine plant.(13) No construction details were available to further describe the impoundment.

Date of Startup: The impoundment was used for approximately 10 years during the 1970's.

Date of Closure: This unit was closed and waste material and some soil were removed to the land treatment unit (Unit 4.1) in 1982.(7)

Wastes Managed: This impoundment was only used when the amine plant was shutdown for maintenance and cleaning activities. During cleaning, the amine regeneration tower was rinsed with water. Most of this washwater was pumped to the foul water tanks (Unit 4.27) for treatment in the wastewater treating system. The final rinsewater was sent to the amine washwater impoundment which acted as an evaporation/percolation pond. Given the operation of the amine plant and these water disposition practices, the impoundment probably contained trace amounts of sulfur compounds and amine solutions.(13) It is not likely that the wastes contain hazardous constituents.

Release Controls: The impoundment is not believed to have been lined. It is unknown if any release controls existed for the impoundment.

History of Releases: There is no file evidence of release nor were visible signs of any prior releases from this impoundment observed during the VSI.(13)

4.20.2 Conclusions

Groundwater Release Potential: No hazardous constituents are believed to have been disposed here, therefore there is no potential for releases to soil or groundwater.

Surface Water Release Potential: No hazardous constituents are believed to have been disposed here, therefore there is no potential for releases to surface water.

Air Release Potential: There is no potential for past or ongoing releases to air.

Subsurface Gas Release Potential: Due to the nature of the unit and the wastes it received, there is no potential for subsurface gas generation.

4.21 LPG AREA COOLING WATER POND

4.21.1 Information Summary

Unit Description: The cooling water pond was located along the fence line at the north end of the Chevron property. It had a capacity of about 1,200,000 gallons and measured 85 ft by 1,100 ft.(7) No other construction data was available to describe the pond. The area is now covered with grasses. During the VSI, there was some rainwater ponding in the area, which is now a grassy field. A few pieces of elemental sulfur was observed on the ground in this general area. Chevron personnel suggested that it came from material used to start up the acid plant.

Date of Startup: Unknown.

Date of Closure: The pond was taken out of service and regraded in 1982.(7)

Wastes Managed: Wastes in this pond included once-through brine cooling water from the LPG refrigeration compressors.(7) This water has been discharged through NPDES Outfall 002 since 1980.(13) No chemical analyses of this cooling water were available. Chevron's NPDES permit requires that TOC be monitored in this discharge.

Release Controls: The pond was diked with crushed coral while in operation. No other release controls are known to have existed for the pond.

History of Releases: No signs of releases from the pond were noted in the pond area during the VSI.

4.21.2 Conclusions

Groundwater Release Potential: It is unknown if the cooling water contains hazardous constituents. However, if any were present in the cooling water, there may have been past releases to soil and groundwater due to the unlined construction of the pond. Potential for ongoing releases from the pond cannot be determined.

Surface Water Release Potential: The potential for past releases to surface water cannot be determined. There is no potential for ongoing releases to surface water from this pond. Current discharges of the cooling water are regulated under NPDES.

Air Release Potential: There is no potential for ongoing releases from this unit. The potential for past releases from the pond cannot be determined.

Subsurface Gas Release Potential: Due to the general nature of the wastewaters placed in this unit, i.e. brine water, there is no potential for subsurface gas generation.

4.22 SOUTH OCEAN POND

4.22.1 Information Summary

Unit Description: The south ocean pond is located along the west fence line at the south end of the refinery. It measures 90 ft by 240 ft and has a capacity of 900,000 gallons.(7) The pond is constructed above grade and is unlined. Its approximate depth is six to eight feet and it is surrounded by crushed coral dikes about six feet in height. During the VSI, the pond contained one to two feet of liquid, leaving four to five feet of freeboard. Oily staining of the interior dike walls was noted during the VSI. The staining came to within 1.5 ft of the top of the pond dike, indicating that the level of the water in the pond may have exceeded two feet of freeboard in the past.(13)

Date of Startup: The pond is estimated to have been put into service in about 1960.(13)

Date of Closure: The pond is an active unit.(13)

Wastes Managed: The pond is used during heavy rains to temporarily hold storm water which enters the pond via the north ocean pond overflow trough.(13) The water is held until it can be routed back to the wastewater treatment system during lower flows.(7) The pond can also receive overflow from the IAF pond (Unit 4.12).(13) These wastewaters are expected to contain hazardous constituents, including benzene, phenols, naphthalene, and possibly metals.

Release Controls: The pond has dikes of crushed coral about 6 feet in height. During the VSI, dikes appeared eroded, particularly on the west side. At the time of the VSI, there were between 4 and 5 feet of freeboard in the pond.(13)

History of Releases: There is no file evidence of release from this unit. Staining of interior dike walls observed during the VSI suggest releases to soil.

4.22.2 Conclusions

Groundwater Release Potential: Potential exists for releases to soil and groundwater from this unit due to the presence of hydrocarbons which have

stained the interior dike wall. The oily staining suggests that hazardous constituents may be present and available for migration to the groundwater.

Surface Water Release Potential: Dike erosion observed on the west side of the pond indicate an ongoing potential for release to surface water. The Pacific Ocean is less than 100 ft west of the pond.

Air Release Potential: Potential for air releases from this unit is believed to be low.

Subsurface Gas Release Potential: Due to the nature of this unit and the wastes it receives, there is no potential for subsurface gas generation.

4.23 NORTH OCEAN POND

4.23.1 Information Summary

Unit Description: The north ocean pond is located east of the acid plant along the west fenceline of the refinery. It is constructed above grade and measures 90 ft by 970 ft by approximately 6 ft deep and holds 3,500,000 gallons.(7) It is connected to the south ocean pond by a gravity overflow pipe.(13) During the VSI the pond contained one to two feet of liquid. There was oily staining of the inside of the dike walls and erosion of the exterior west dike wall.(13)

Date of Startup: The estimated date of startup is around 1960.(13)

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond serves the same function as the south ocean pond, holding storm water runoff during periods of high rainfall until the water can be routed back into the wastewater treatment system during periods of lower flow.(7) The storm water is expected to contain hazardous constituents typical of oily wastes including benzene, toluene, naphthalene, phenols, metals and other compounds.

Release Controls: The pond is diked with crushed coral. Dikes are about 6 feet in height.

History of Releases: There was no evidence of pond overflow during the VSI. Water in puddles outside the west dike of the pond appeared slightly gray, a discoloration which could indicate seepage from the pond.(13)

4.23.2 Conclusions

Groundwater Release Potential: Oily staining of interior pond walls indicates the potential for migration of any hazardous constituents to groundwater.

Surface Water Release Potential: Eroded dikes and discoloration of puddles outside the dike show potential for releases to surface water from this unit.

Air Release Potential: The pond contains some oily material. There is a potential for air releases from evaporation of volatile and semivolatile components in the pond.

Subsurface Gas Release Potential: Due to the nature of this unit and the nature of the wastes it receives, there is no potential for generation of subsurface gas.

4.24 WASTE PILE A

4.24.1 Information Summary

Unit Description: Waste Pile A is located west of Landfill B and east of the tank farm at the northwest corner of the property. The dimensions and capacity of the waste pile are described by the facility as "unknown" in its SWMU response letter.(7) During the VSI black and blue catalyst pellets were observed on the ground in the area. The area apparently occupied by the waste pile has dimensions of about 15 by 40 feet along one of the refinery roads. It is located at the edge of a stand of kiawe trees, and is on bare ground. There was also a green substance coating some rocks and soil in low lying areas. (13)

Date of Startup: Unknown.

Date of Closure: Wastes in the waste pile were reportedly removed and disposed off-site in 1984.(7)

Wastes Managed: The waste pile received catalyst fines.(7) Results of analyses of catalyst fines submitted by Chevron in a 1985 Part B revision showed the catalyst to contain arsenic, barium, beryllium, chromium, lead, nickel, silver, and vanadium.(9) However, according to Chevron, the catalyst does not show EP Toxicity characteristics.

Release Controls: No release controls are known to have been used in this area.

History of Releases: Catalyst fines still remain in the waste pile area.

4.24.2 Conclusions

Groundwater Release Potential: According to Chevron, the catalyst fines do not exhibit EP Toxicity. Since metals in the catalysts are not highly leachable, the potential for releases to soil and groundwater are low. The composition of the green material is not known, so potential for release to groundwater from this material cannot be determined at this time.

Surface Water Release Potential: Due to the site topography, there is little potential that any runoff containing possible hazardous constituents from this area would reach surface water.

Air Release Potential: The catalyst fines are of sufficient pellet size that they would not be easily distributed by wind. The potential for past and ongoing air releases from the green material cannot be determined.

Subsurface Gas Release Potential: No wastes were buried in this area, so there is no potential for subsurface gas generation.

4.25 WASTE PILE B

4.25.1 Information Summary

Unit Description: Waste Pile B was located in the area currently occupied by the land treatment unit (Unit 4.1). In its SWMU response letter, Chevron has described the dimensions and capacity of the waste pile as being unknown.(7) No additional information on this unit was obtained during the VSI.

Date of Startup: Unknown.

Date of Closure: Chevron reports that it removed the materials from the waste pile in 1979, prior to the area's conversion to a land treatment unit.(7)

Wastes Managed: There are no records of waste types and quantities which may have been placed in the waste pile. However, according to Chevron, employees have indicated that wastes included refinery catalysts of unspecified composition, asphalt cleanup materials, and refinery rubbish including refractory, scrap iron, and possibly other materials.(7) The refinery catalysts contain various metals, but do not exhibit EP Toxicity characteristics.

Release Controls: No known release controls were associated with Waste Pile B.

History of Releases: It is unknown if any releases may have occurred from this unit.

4.25.2 Conclusions

Groundwater Release Potential: If wastes containing hazardous constituents were placed in this unit, releases to soil and possibly groundwater may have occurred in the past. The wastes have been removed and the area reconstructed into the land treatment unit, so there is no ongoing potential for releases to groundwater from this unit.

Surface Water Release Potential: Runoff from this area follows a small drainage ditch which empties into the Pacific Ocean to the west. There is no ongoing potential for releases to surface water from this unit, since the

waste pile has been removed and replaced with the land treatment unit. If any leachable hazardous materials were among the wastes placed in the waste pile, past releases to surface water may have occurred.

Air Release Potential: There is no potential for releases to air from the waste pile as all wastes have been removed and the area covered by the land treatment unit. The potential for past air releases cannot be determined.

Subsurface Gas Release Potential: The waste pile was placed above ground, so there is no potential, past or present, for generation of subsurface gas.

4.26 WASTE PILE C

4.26.1 Information Summary

Unit Description: Waste Pile C is located north of the north ocean pond near the west fence line. It has dimensions of about 600 ft by 90 ft by about 6 ft in height.(7,13)

Date of Startup: Unknown.

Date of Closure: This is an active unit.

Wastes Managed: The area has been used to dry dewatered lime blowdown and sludge from the flare lime basin and spent filter clay from the clay dewatering basin. The waste pile also received fluid catalytic cracker catalyst and unspecified "non-hazardous" pond sludges prior to 1982.(7) During the VSI it was observed that lime makes up the majority of the material in the waste pile, there are small amounts of catalyst and some pieces of tar in the waste pile area. There is also some spent jet filter clay in the Waste Pile.(13) It is unknown whether the lime contains hazardous constituents. The filter clay contains metals and some Appendix VIII organic constituents. The catalyst fines contain metals, but according to Chevron do not exhibit EP Toxicity characteristics.

Release Controls: There are no release controls for this unit. However, it does rest on flat ground with no apparent runoff towards the sea. There is a low embankment separating the wastepile from the riprap sea wall which lies to the west.(13)

History of Releases: There are no reported releases from this unit. The wastes are in direct contact with the ground, so hazardous constituents present could be released to soil or groundwater.(13)

4.26.2 Conclusions

Groundwater Release Potential: If leachable hazardous constituents are present in wastes in this unit, there is potential for past and ongoing releases to soil and groundwater.

Surface Water Release Potential: Due to the topography of the area, there is little potential for past and ongoing releases to surface water.

Air Release Potential: There is some potential for releases to air of hazardous constituents via windborne particulates.

Subsurface Gas Release Potential: If anaerobic conditions occur in the pile, the decomposition of hydrocarbons may result in the generation of methane. The methane may then serve as a carrier for the volatile organic constituents in the jet fuel filter clay.

4.27 FOUL/SOUR WATER TANKS 303 AND 304

4.27.1 Information Summary

Unit Description: Tanks 303 and 304 are located north of the API separator. Each is constructed of steel, has a floating roof, and is 38 ft in diameter by 42 ft high and has a capacity of 335,000 gallons.(7)

Date of Startup: Unknown.

Date of Closure: These are active units.(7)

Wastes Managed: The tanks receive refinery foul water streams prior to treatment at the foul water oxidizer. They serve as pretreatment units for solids removal, emulsion settling, oil skimming and to dilute streams with high concentrations of contaminants.(7) Constituents of wastewater treated in the tanks include sulfides and ammonia.(7) It is unknown whether the wastewater contains hazardous constituents.

Release Controls: The tanks rest on adjacent concrete pads. They are not secondarily contained.(13)

History of Releases: There is no file evidence of release from these tanks. No evidence of leakage or spills around either tank was observed during the VSI.(13)

4.27.3 Conclusions

Groundwater Release Potential: The tanks are in good condition and there is no evidence of leakage or spills. There does not appear to be potential for releases to groundwater at this time.

Surface Water Release Potential: Due to the condition of the tanks and the wastes they contain, there does not appear to be potential for release at this time.

Air Release Potential: The tanks are equipped with floating roofs to prevent formation of air space above the liquid inside. No potential for release of air from the tanks is perceived at this time.

Subsurface Gas Release Potential: Due to the nature of this unit and the wastes they receive, there is no potential for generation of subsurface gases.

4.28 FOUL WATER OXIDIZER

4.28.1 Information Summary

Unit Description: The foul water oxidizer is a wastewater treating unit located on the south side of the boiler plant. The unit consists of two steel towers: foul water oxidizer and ammonia stripper. Foul water, Chevron's name for process wastewater, is mixed with air and enters the bottom of the foul water oxidizer. The oxidizer is a steel tray tower six feet in diameter and 45 feet high.(7) The air/foul water stream exits the top of the oxidizer to a flashdrum. Overhead from the flashdrum is 99% water vapor, and the remaining 1% is carbon dioxide, sulfur dioxide, and nitrates. This vapor stream is released to the atmosphere via the carbon monoxide boiler stack. The liquid stream from the bottom of the flashdrum is sent to the ammonia stripper for ammonia removal. Effluent from the ammonia stripper is discharged to the storm water sewer for additional treating in the wastewater treating system. (7,13) The area around and below the unit is concrete paved. The condition of the unit appeared to be good at the time of the VSI; there are no visible signs of deterioration, rust spills or leaks.

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7,13)

Wastes Managed: The oxidizer receives foul water from Tanks 303 and 304 (Unit 4.27). The water is heated and exposed to air to oxidize potentially reactive compounds to non-reactive species prior to the waste stream being discharged to the wastewater treatment system.(7) It is unknown if wastes managed in this unit contain hazardous constituents.

Release Controls: The operation of this unit is controlled by instrumentation pressure and temperature controllers.(13)

History of Releases: There is no file evidence of release from this unit. No visual signs of any spills or leaks at this unit were observed during the VSI.(13) This unit operates continuously with minimal downtime.(13)

4.28.2 Conclusions

Groundwater Release Potential: Due to the construction and condition of this unit, there is minimal potential for past or ongoing release to soil and groundwater.

Surface Water Release Potential: Due to the construction and condition of this unit, there is minimal potential for past and ongoing release to surface water.

Air Release Potential: This unit releases water vapor, carbon dioxide, sulfur dioxide and nitrogen via the carbon monoxide boiler stack. Due to the nature of this unit's operation, the potential for release of hazardous constituents to the air is very low.

Subsurface Gas Release Potential: Due to the nature of this unit, there is no potential for subsurface gas release.

4.29 WEAK ACID NEUTRALIZATION SUMP

4.29.1 Information Summary

Unit Description: The weak acid neutralization sump is located west of the strong acid neutralization sump. It is five feet in diameter and eight feet deep. The sump is constructed of concrete with an acid-resistant brick liner.(7) It is covered with pieces of wood.(13)

Date of Startup: The sump was constructed when the refinery began operation in 1960.(13)

Date of Closure: This is an active unit.(7)

Wastes Managed: This unit receives weak sulfuric acid from the Acid Plant. Here it is mixed with caustic to neutralize it to a pH of between 2 and 12.5. The neutralized effluent is discharged via the acid sewer to the neutralization pond for secondary neutralization.(7) According to facility personnel, no accumulation of solids in the sump occurs.(13)

Release Controls: The sump is lined with acid-resistant brick. The integrity of the liner could not be confirmed during the VSI.

History of Releases: There is no history of releases from this unit.

4.29.2 Conclusions

Groundwater Release Potential: Because the integrity of the brick liner could not be verified during the VSI, there is a potential for releases to soil and groundwater.

Surface Water Release Potential: The sump is constructed below grade, and does not show evidence of any overflow, therefore there is no potential for releases to surface water.

Air Release Potential: The sump is covered, therefore, there is no potential for releases to air.

Subsurface Gas Release Potential: There is no potential for generation of subsurface gas in this unit.

4.30 STRONG ACID NEUTRALIZATION SUMP

4.30.1 Information Summary

Unit Description: The strong acid neutralization sump is located on the south side of the sulfuric acid plant, east of the weak acid neutralization plant. It is five feet in diameter and eight feet deep.(7) The sump has a concrete cover.(13) It is believed to be lined with acid-resistant brick, although this could not be confirmed during the VSI.

Date of Startup: The sump was reconstructed in 1984, although the original sump structure is believed to have been in use since refinery startup in 1960.(13)

Date of Closure: This is an active unit.(7,13)

Wastes Managed: The sump receives acid spills from the acid plant, therefore it only operates during upset conditions. Caustic is added at the sump to adjust the pH to between 2 and 12.5. The neutralized solution is then pumped to the neutralization basin.(13)

Release Controls: In the event of a spill, the spill will automatically drain to the strong acid neutralization sump. An alarm sounds in the control room on high level in the sump and the sump pump automatically cuts in. The sump has a concrete cover. The sump is located in the acid plant process block which is continuously manned by process operators. The acid plant is surrounded by a three inch curb to contain spills. The sump is believed to have been lined with acid resistant brick. However, this could not be confirmed during the VSI.

History of Releases: There were no visible signs of any prior releases from this unit during the VSI, and the facility does not report any releases.(13)

4.30.2 Conclusions

Groundwater Release Potential: The condition of the sump prior to its reconstruction in 1984 is unknown. If it was in deteriorated condition, it is possible there may have been releases to soil and groundwater. Because the

integrity of the sump could not be verified during the VSI, there is an ongoing potential for release.

Surface Water Release Potential: The sump is below ground, and shows no evidence of overflow, so potential for release to surface water is believed to be low.

Air Release Potential: The sump is topped by a concrete cover, so the potential for air releases is very low.

Subsurface Gas Release Potential: There is no potential for generation of subsurface gases in the sump.

4.31 ALKYLATION PLANT NEUTRALIZATION SUMP

4.31.1 Information Summary

Unit Description: The sump is located on the west end of the alkylation and isomerization plant. It measures 7 ft wide by 15 ft long by 7 ft deep. It is constructed of concrete and has an acid-resistant brick liner.(7) It is normally covered with a manhole cover. During the VSI, the brick visible near the top of the sump appeared to be in good condition.(13)

Date of Startup: The sump was installed when the refinery began operation in 1960.(13)

Date of Closure: This is an active unit.(7)

Wastes Managed: The sump receives acid spills and washdown water from the alkylation plant. Here they are mixed with caustic and neutralized to a pH between of 2 and 12.5. Sump effluent is discharged to the waste water treatment system through the acid sewer.(7,13) It is not known if the wastes in the sump contain hazardous constituents.

Release Controls: The concrete sump is lined with acid-resistant brick.(7)

History of Releases: There is no file evidence of release from this unit. No signs of wear or damage to the sump liner bricks were observed during the VSI. The integrity of the sump could not be fully verified during the VSI.

4.31.2 Conclusions

Groundwater Release Potential: Because the integrity of the sump could not be verified in the VSI, there is a potential for release to soil and groundwater.

Surface Water Release Potential: The sump is located below ground level and is constructed to collect spills. There is no potential for releases to surface water.

Air Release Potential: The sump is kept covered, therefore, the potential for releases to air is low.

Subsurface Gas Release Potential: There is no potential for generation of subsurface gases in the sump.

4.32 STORM WATER DRAINAGE SWALE AND CULVERT

4.32.1 Information Summary

Unit Description: Storm water from the flare area, south of the wastewater treatment system and the land treatment unit collects in a drainage swale, flowing south of the impounding basin and discharging to the Pacific Ocean south of the IAF unit.(8,13) The discharge is not authorized by NPDES, despite the fact that it constitutes a Group I storm water discharge from point source.(8)

Date of Startup: Unknown.

Date of Closure: This is an active unit.

Wastes Managed: The drainage swale collects stormwater from the south end of the refinery.(13) The stormwater may contain hazardous constituents characteristic of oily wastes, including benzene, toluene, naphthalene, metals and other compounds. The swale also runs adjacent to Brewer Chemical at Chevron's southern property boundary. Heavily discolored soil was observed along the fenceline adjacent to the swale during the VSI, suggesting that runoff from Brewer Chemical is entering the drainage swale prior to its discharge to the ocean.

Release Controls: There are no release controls associated with this unit.

History of Releases: The drainage swale discharges through a culvert to the Pacific Ocean. It is not an NPDES authorized discharge.(8,13)

4.32.2 Conclusions

Groundwater Release Potential: Any hazardous constituents present in the stormwater which flows through this drainage swale may be released to soil or groundwater.

Surface Water Release Potential: Any hazardous constituents present in the stormwater are discharged directly to the Pacific Ocean south of the IAF unit. This is not an NPDES authorized discharge.

Air Release Potential: There is potential for air releases from this unit due to the likely presence of hazardous constituents in stormwater in the swale.

Subsurface Gas Release Potential: This is an above ground unit. There is no potential for generation of subsurface gas.

4.33 CLAY DEWATERING BASIN

4.33.1 Information Summary

Unit Description: The clay dewatering basin is located west of the crude distillation unit and south of the clay filters. The basin is constructed of reinforced concrete. The bottom of the basin slopes from ground level on the south side to about 3.75 feet deep on the north side. Water flows down the basin into a wastewater collection channel and drains to the oily sewer system (Unit 4.35). A gravel filter and screen prevent any clay from entering the channel. Dewatered clay is loaded into dump trucks and hauled to a municipal landfill.(13) The basin is 29 ft wide by 40 ft long by 3.75 ft deep.(7)

Two clay filters are located about 100 feet north of the dewatering basin. Each filter has a clay dump line which runs from the base of the filter to about the middle of the dewatering basin. To dump a load of clay, a series of manually operated valves are opened and the clay flows by gravity from the elevated filters to the dewatering basin. Clay is dumped every 6 to 12 months.(13) The clay dewatering basin was in use at the time of the visual site inspection. There was approximately one foot of water in the wastewater collection basin. This water was covered by a layer of oil.(13)

Date of Startup: It is estimated that this unit was installed at the time the refinery was built in 1960.(13)

Date of Closure: This is an active unit.(7,13)

Wastes Managed: The basin receives spent clay from refinery clay treaters for dewatering. The clay is used to treat jet fuel to improve color, eliminate water and preferentially remove any olefins. Olefins are straight chain hydrocarbons with one or more diene bonds.(7,13)

Release Controls: The basin is constructed of concrete with curbed side walls to prevent releases. The basin is connected to the oily water sewer.

History of Releases: There is no file evidence of release from this unit. There were no visual signs of any previous spills or leaks at this unit observed during the VSI.(13)

4.33.2 Conclusions

Groundwater Release Potential: The potential for past or ongoing soil or groundwater release from this unit is considered low due to the construction and conditon of the unit.

Surface Water Release Potential: There were no signs of overflow from the unit. It is located in an area with flat topography, therefore there is little potential for releases to surface water.

Air Release Potential: There may be potential for past and ongoing air releases from this unit from clay containing olefins.

Subsurface Gas Release Potential: Due to the construction of the unit and the wastes it receives, there is no potential for subsurface gas generation.

4.34 OIL RECOVERY BOX (AKA WASTE OIL BOX)

4.34.1 Information Summary

Unit Description: The oil recovery box is located north of Tank 304. It is constructed of reinforced concrete and is 10 ft wide by 42 ft long by 5 ft high.(7) The unit is built into the side of a small hill, the western wall is completely exposed and the top of the eastern wall is flush with the top of the hill. There is a platform on the east side of the unit for personnel access. Oil to be recovered is manually dumped or shoveled into the recovery box. A steam coil inside the box heats the oil to liquify any solid materials and maintain a pumpable viscosity. An oil recovery pump, located on the north side of the box takes suction near the bottom of the box and pumps it to the oil recovery tanks.(13)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7,13)

Wastes Managed: Wastes placed in this unit include recovered oil from spills or cleanup of process systems. The box serves as a settling unit for solids in the oily wastes. Solids are periodically removed and placed in the land treatment unit (Unit 4.1).(7) These recoverable oils are expected to contain Appendix VIII constituents including aromatic hydrocarbons.

Release Controls: Materials can only be put into the oil recovery box manually, thereby providing operator prevention of overtopping.(13)

History of Releases: There were signs of previous spills around this unit observed during the VSI. The exposed western wall is about 25 percent covered by hydrocarbon drips. The ground around the unit is dotted with hydrocarbon stains and solidified heavy hydrocarbons. The oil recovery pump and associated piping is heavily coated with oil. The pump sits on a metal grating which is also heavily coated. This grating covers an opening which could not be identified during the VSI, but which Chevron agreed to identify as soon as possible.

4.34.2 Conclusions

Groundwater Release Potential: Spills of oily material to soil around the unit were observed during the VSI. There is potential for past and ongoing releases of hazardous constituents to groundwater, based on evidence of spills in this area during the VSI.

Surface Water Release Potential: This unit is located in an open drainage area which drains directly to the Pacific Ocean via the storm water swale and culvert. There is a high potential for past and ongoing releases to surface water, based on the evidence of spills in the VSI.

Air Release Potential: The unit has potential for past and ongoing air releases from oily materials which are heated in this unit.

Subsurface Gas Release Potential: Although this unit is constructed above ground, there is a potential for subsurface gas generation from spillage and leakage of materials around the unit.

4.35 OILY SEWER SYSTEM

4.35.1 Information Summary

Unit Description: The refinery is equipped with an oily sewer system.(7) The sewer discharges into the API separator. The sewer system is constructed primarily of carbon steel pipe. The integrity of the sewer system could not be confirmed during the VSI.(8,13)

Date of Startup: The system was constructed along with the rest of the refinery in 1960.(13)

Date of Closure: This is an active unit.(13)

Wastes Managed: The oily sewer system captures process wastewater from the crude and product storage tanks, most of the process areas and the laboratory.(8)

Release Controls: It is unknown whether release controls are associated with this unit.

History of Releases: Chevron does not report any releases from this unit.

4.35.2 Conclusions

Groundwater Release Potential: The integrity of the sewer system could not be confirmed during the VSI. If it is in poor condition, there is potential for releases to soil and groundwater.

Surface Water Release Potential: The sewer system is constructed entirely below ground level, therefore there is no potential for releases to surface water.

Air Release Potential: The sewer system is below ground, therefore there is little potential for releases to air.

Subsurface Gas Release Potential: There may be potential for generation of hydrogen sulfide in the oily sewer.

4.36 ACID SEWER SYSTEM

4.36.1 Information Summary

Unit Description: The acid sewer collects acid waste streams from process areas within the plant and leads to the neutralization basin.(8) It is constructed of vitrified clay pipe and CPVC pipe, an acid resistant synthetic material.(13) The sewer is constructed entirely underground. The integrity of the sewer could not be confirmed during the VSI.

Date of Startup: The sewer is believed to have been constructed along with the rest of the refinery in 1960.(13)

Date of Closure: This is an active unit.(13)

Wastes Managed: An acid sewer collects corrosive waste streams such as spent caustics from the alkylation plant, weak acid from the acid plant and boiler blow down water.(8)

Release Controls: It is unknown what release controls are associated with the acid sewer.

History of Releases: Chevron has not reported any releases from this unit.

4.36.2 Conclusions

Groundwater Release Potential: The integrity of the sewer could not be determined. If the sewer is in poor condition, there is potential for releases to soil and groundwater.

Surface Water Release Potential: The system is constructed underground, therefore there is little potential for releases to surface water.

Air Release Potential: The sewer is constructed underground, releases to air are not considered likely.

Subsurface Gas Release Potential: There may be potential for generation of hydrogen sulfide in the sewer.

4.37 STORM BAY AND STORM SEWER

4.37.1 Information Summary

Unit Description: The storm bay is a large wet well equipped with pumps. It is located east of the Acid plant. It is used to pump storm water from various sections of the refinery to the north surge pond or to the north and south ocean ponds.(8) During periods of heavy rainfall, stormwater runoff is sent via the storm bay to the ocean ponds. When capacity becomes available in the wastewater treating system, the stormwater in the ocean ponds is pumped to the north surge pond, again via the storm bay.

The storm bay is constructed of reinforced concrete and is approximately ten feet square and 8 feet deep. The stormwater sewer, which is constructed primarily of clay pipe, discharges into the north end of the storm bay. Three transfer pumps are on the south side. The three pumps are: (1) feed to the north surge pond (2) transfer to the ocean ponds and (3) transfer to the oil recovery tanks.

Discharge from the ocean ponds enters on the west side of the storm bay. A steel underflow weir partitions off the western 25 percent of the storm bay and collects any oil entering from the ocean ponds. The oil recovery pump takes suction from this partitioned area in the storm bay and pumps the oil to the oil recovery tanks. During the visual site inspection this area was completely covered with oil and the oil recovery pump was not in operation.

A skimmer sits about one foot downstream of the stormwater sewer discharge. The skimmer was heavily coated with hydrocarbons at the time of the visual site inspection. The interior walls of the storm bay were oil stained.

Date of Startup: The storm bay is believed to have been constructed in 1961 with the rest of the refinery.(13)

Date of Closure: This is an active unit.(8,13)

Wastes Managed: The storm sewer and storm bay receive storm water runoff from the refinery, containing various oily wastes. These oils are expected to

contain hazardous constituents typical of complex hydrocarbons. The specific chemical characteristics of the liquid in this unit have not been determined.

Release Controls: During periods of high flow rate, stormwater is directed to the ocean ponds.

History of Releases: There is no file evidence of release from this unit. There were no visible signs of any leaks, spills, or overflows during the VSI.

4.37.2 Conclusions

Groundwater Release Potential: The integrity of the walls and base of the storm bay and the storm sewer could not be verified during the VSI; therefore, there is potential for soil and groundwater releases.

Surface Water Release Potential: The unit is constructed below grade, there is little potential for release to surface water.

Air Release Potential: Past and ongoing air releases are a high potential at this unit due to oily material which is present.

Subsurface Gas Release Potential: Due to the nature of this unit, there is no potential for subsurface gas generation.

5.0 CONCLUSIONS

A RCRA facility assessment (RFA) was performed to identify and assess solid waste management units (SWMUs) and other areas of concern at the Chevron USA Inc. Hawaiian Refinery at Barbers Point, Oahu, Hawaii. The RFA utilizes a records review, data evaluation, interviews, and a visual site inspection to evaluate the potential for releases of hazardous constituents to the environment from areas identified during the assessment. The Chevron refinery is applying for a Part B operating permit for their land treatment unit, the IAF pond, and the flare oily basin.

A total of 37 SWMUs were identified and evaluated at the Chevron Hawaiian refinery in the course of this assessment. SWMUs identified include the following:

- Land Treatment Unit (Unit 4.1) (RCRA regulated)
- Inactive Land Treatment Area (Unit 4.2)
- API Separator (Unit 4.3)
- North Surge Pond (Unit 4.4)
- South Surge Pond (Unit 4.5)
- Oxidation Ponds (Unit 4.6)
- Neutralization Basin (Unit 4.7)
- Settling Basin (Unit 4.8)
- Impounding Basin (Unit 4.9)
- Outfall Sump (Unit 4.10)
- IAF Unit (Unit 4.11)
- IAF Pond (Unit 4.12) (RCRA regulated)
- Drum Storage Area (Unit 4.13)
- Flare Oily Basin (Unit 4.14) (RCRA regulated)
- Flare Lime Basin (Unit 4.15)
- Landfill A (Unit 4.16)
- Landfill B (Unit 4.17)
- Inactive Clay Dewatering Impoundment (Unit 4.18)
- Sewer Sludge Impoundment (Unit 4.19)
- Amine Washwater Impoundment (Unit 4.20)
- LPG Area Cooling Water Pond (Unit 4.21)
- South Ocean Pond (Unit 4.22)
- North Ocean Pond (Unit 4.23)
- Waste Pile A (Unit 4.24)
- Waste Pile B (Unit 4.25)
- Waste Pile C (Unit 4.26)
- Foul/Sour Water Tanks 303 and 304 (Unit 4.27)
- Foul Water Oxidizer (Unit 4.28)
- Weak Acid Neutralization Sump (Unit 4.29)
- Strong Acid Neutralization Sump (Unit 4.30)

- o Alkylation Plant Neutralization Sump (Unit 4.31)
- o Storm Water Drainage Swale and Culvert (Unit 4.32)
- o Clay Dewatering Basin (Unit 4.33)
- o Oil Recovery Box (Unit 4.34)
- o Oily Sewer System (Unit 4.35)
- o Acid Sewer System (Unit 4.36)
- o Storm Bay and Storm Sewer (Unit 4.37)

The inability of Chevron to collect unsaturated zone samples at the active land treatment unit indicates the potential that lysimeters have been incorrectly placed or are inadequately monitored to determine whether releases are occurring. Unsaturated zone monitoring is required under Subpart M, Part 264.

The units of primary concern at the facility are the wastewater treatment system ponds (Units 4.4-4.10, 4.12, 4.22, 4.23). None of the ponds is lined, and analyses have shown Appendix VIII constituents in all the pond sludges. The lack of liners and the porous nature of the soils at the facility make migration of hazardous constituents to groundwater likely. Some of the ponds were being operated with less than two feet of freeboard, increasing the potential for overflow and possible release to surface water. The open construction of the impoundments raises the possibility that releases to air of hazardous constituents may be occurring.

A second area of concern is the oil recovery box (Unit 4.34), which is used for recovery of oils from spills or process cleanup. There was spilled oil and tarry material on the ground around the unit, indicating potential for releases to groundwater, surface water, and to air.

The API separator (Unit 4.3) exhibits similar problems as the oil recovery box. The outer concrete of the separator is cracked, and oily material has seeped through. The ground next to the unit on its east side is stained with oil. There are also caked hydrocarbons on the outside of the south wall of the separator.

The stormwater drainage swale and culvert (Unit 4.32) is an unauthorized discharge of stormwater to the ocean, in violation of NPDES regulations. This unit, which Chevron plans to eliminate by the end of 1986, appears to be, in addition to collecting stormwater runoff from Chevron, collecting runoff from

the Brewer Chemical property to the south. It may also have potential releases of hazardous constituents to soil, groundwater, and air, in addition to the surface water discharge.

The drum storage area (Unit 4.13), which contains mostly empty drums, shows signs of release to soil and potentially to groundwater. Drums are stored on bare ground. Many are rusted and deteriorated. There is stained soil around some of the drums, and colored oily substance was observed to be floating on some rain puddles in the drum storage area.

The flare oily basin, a RCRA regulated unit (Unit 4.14), has potential for air and groundwater releases due to sludges with hazardous constituents which have been placed in the unlined basin. This unit will be closed as soon as the RCRA permit is approved.

Several SWMUs, including the LPG cooling water impoundment (Unit 4.21), Landfill A (Unit 4.16), the clay dewatering impoundment (Unit 4.18), Waste Piles A and B (Units 4.24, 4.25), and the inactive land treatment unit (Unit 4.2), are no longer in use, but may have potential for releases to soil or groundwater. Wastes have been removed from the impoundments and the inactive land treatment unit, but insufficient data was available to determine whether hazardous constituents may remain.

The clay dewatering basin (Unit 4.33) does not appear to pose a potential for releases to soil, groundwater, or surface water, but may be releasing hazardous constituents to air. Similarly, Waste Pile C (Unit 4.26) has potential for release of hazardous constituents to air.

The sumps (Units 4.29-4.31) all have potential for release of hazardous constituents to soil and groundwater, because the integrity of those units could not be verified during the VSI.

The storm sewer (Unit 4.37), acid sewer (Unit 4.36), and oily sewer (Unit 4.35) were constructed below ground when the refinery was built in 1960. Their integrity could not be verified during the VSI. The integrity of the liners of the three neutralization sumps could not be verified during the VSI.

The IAF unit (Unit 4.11), the foul/sour water tanks (Unit 4.27), foul water oxidizer (Unit 4.28), Landfill B (Unit 4.17), the sewer sludge impoundment (Unit 4.19), and amine washwater impoundment (Unit 4.20) do not appear to present a potential for hazardous constituent releases at this time.

REFERENCES

1. Brode, T., 7/22/85. EPA RCRA Inspection Report for Chevron USA Hawaiian Refinery, Ewa Beach, HI, 3/13/85.
2. Shane, D., 6/14/84. EPA RCRA Investigation Report for Chevron USA Hawaiian Refinery, Ewa Beach, HI, 6/14/84.
3. Hawaii State Department of Health Noise and Radiation Branch Fact Sheet for a Permit Application, Chevron USA Hawaiian Refinery, undated.
4. Lee, D. 10/20/76. Hawaii Department of Health Pollution Investigation and Enforcement Branch In-Depth Inspection Report, Standard Oil Company of California.
5. Hagler, M., 12/20/84. Notification of Hazardous Waste Site, Chevron USA Hawaiian Refinery.
6. Ecology and Environment, 3/17/81. Site Inspection Report on the Potential Hazardous Waste Site: Chevron USA, Inc. Hawaiian Refinery. Report marked CONFIDENTIAL.
7. Holmes, M. 8/5/85. Chevron letter to H. Seraydarian, EPA Region 9, containing response to Solid Waste Management Unit Questionnaire.
8. Arthur, G. 1/24/86. EPA NPDES Compliance Monitoring Report Chevron USA Hawaiian Refinery, Inspection date 8/8/85.
9. Holmes, M. 11/5/85. Chevron letter to T. Anamizu, Hawaii Dept. of Health containing RCRA Part B Permit Application Revision.
10. Chang, D. 12/26/85. Hawaii Department of Health RCRA Facility Inspection, Chevron USA Hawaiian Refinery, 12/26/85.
11. Weis, W. III, 9/8/86. RCRA TSD Investigation, Chevron USA Hawaiian Refinery, 6/18/86.
12. Chevron USA Hawaiian Refinery, January 1985, RCRA Part B Permit Application.
13. RCRA Facility Assessment Visual Site Inspection, Chevron Hawaiian Refinery, 11/12-13/86.
14. Hawaii Department of Health Pollution Investigation and Enforcement Branch Inspection of Standard Oil of California Refinery, 5/9/75.
15. Chevron U.S.A Hawaiian Refinery NPDES Permit No. HI0000329, 3/22/86.
16. National Oceanic and Atmospheric Administration, 1983, Local Climatological Data for Honolulu, Hawaii.

Appendix 1

VISUAL SITE INSPECTION SUMMARY AND PHOTOGRAPHS

VISUAL SITE INSPECTION SUMMARY

A visual site inspection (VSI) of the Chevron U.S.A., Inc. Hawaiian Refinery at Campbell Industrial Park on Oahu, Hawaii was conducted on November 12-13, 1986. The inspection was conducted by Leigh Starlin, Gwenn Caldwell, and Stewart Sonnenfeldt. Ray Corey, Peter Rubenstein, and Hannibal Joma represented the U.S. Environmental Protection Agency. Daniel Chang, Les Segundo, and Grace Marcos represented the Hawaii Department of Health Noise and Radiation Branch.

The inspection commenced at about 8:30 on November 12, starting with a meeting with the following Chevron representatives:

- Tom Shaffer, Lead Design Engineer
- Jim Kappel, Area Supervisor
- Mike Shire, Chief Engineer
- Jim Judkins, Operations Superintendent
- Gerhard Mekelburg, Lab Technician
- Mervyn Ahtou, Shift Supervisor
- Bill Stone, Dimersol Project Manager

Several other unnamed refinery personnel assigned to units under inspection answered questions and provided information where possible.

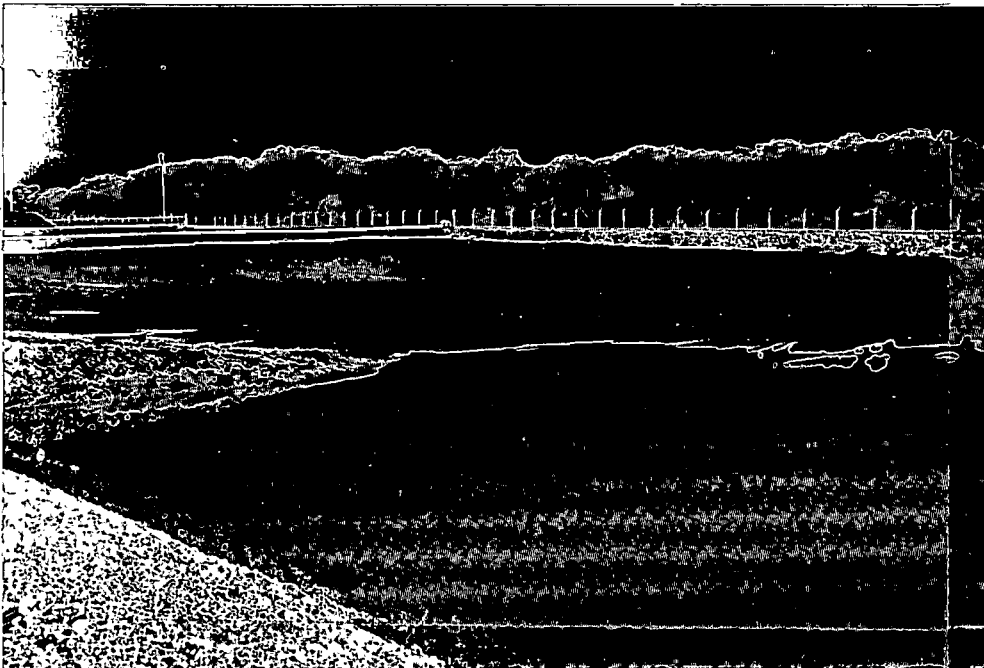
A facility inspection was made of inactive and active solid waste management units (SWMUs) throughout the facility as well as some process areas. Thirty-seven SWMUs were identified at the refinery.

Weather during the inspection of the solid waste management units was partly cloudy with temperatures in the 80's. Winds were less than 10 mph from the west. A rain gauge at Chevron had recorded 1.69 inches of rain in the 24 hours prior to the inspection.

The inspection was completed at about 1:00 p.m. on November 13. An outbriefing meeting was held with Tom Shaffer of Chevron, who had accompanied the inspection team during both days to clarify remaining questions and discuss preliminary conclusions of the VSI.



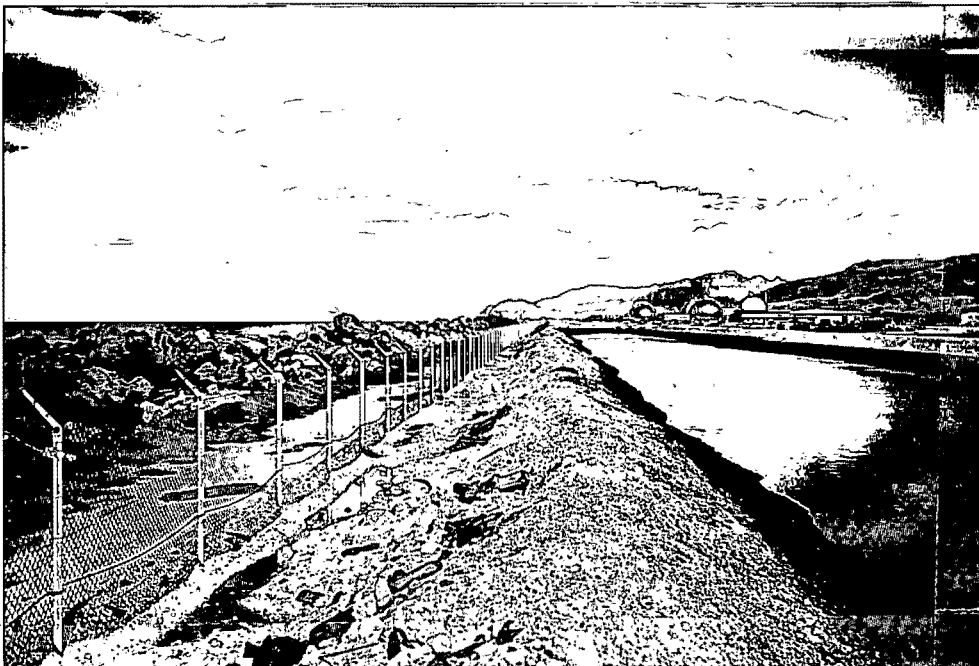
Chevron USA Hawaiian Refinery 11/12-13/86
Land treatment unit, facing west



Chevron USA Hawaiian Refinery 11/12-13/86
Ponding within land treatment unit, facing southeast



Chevron USA Hawaiian Refinery 11/12-13/86
North Ocean Pond facing north



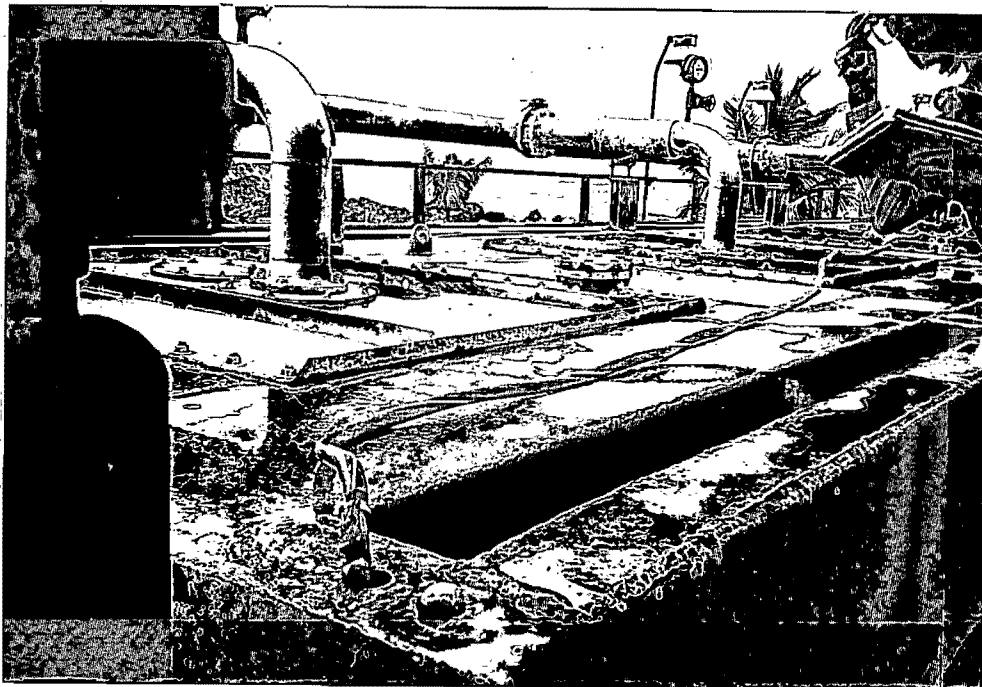
Chevron USA Hawaiian Refinery 11/12-13/86
North Ocean Pond, eroded west dike, facing north



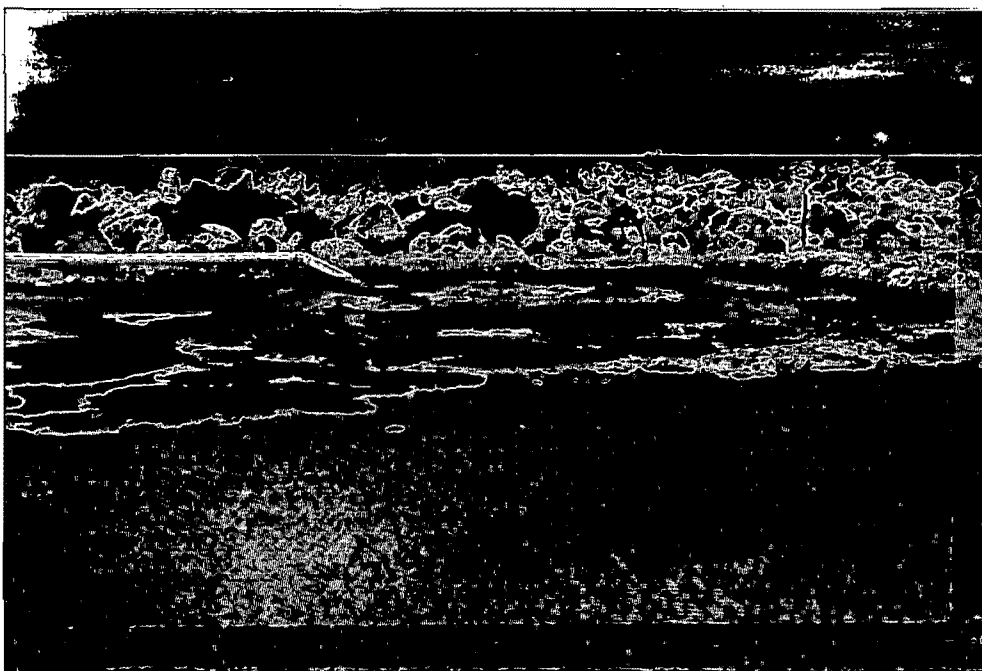
Chevron USA Hawaiian Refinery 11/12-13/86
South Ocean Pond, facing northwest



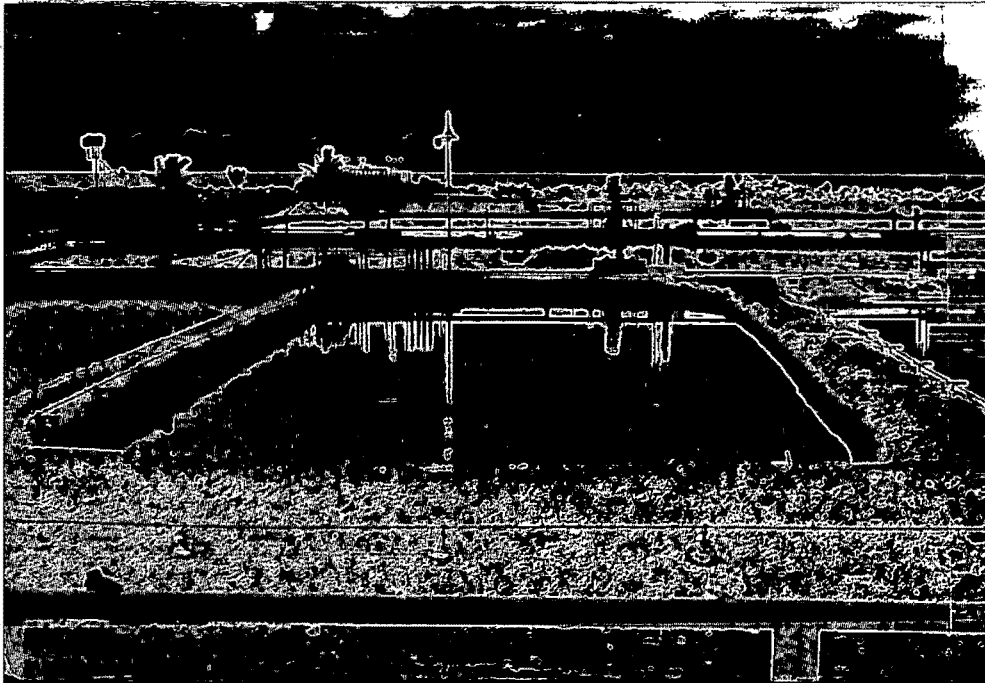
Chevron USA Hawaiian Refinery 11/12-13/86
South Ocean Pond, facing south



Chevron USA Hawaiian Refinery 11/12-13/86
IAF Unit



Chevron USA Hawaiian Refinery 11/12-13/86
IAF Pond, facing west



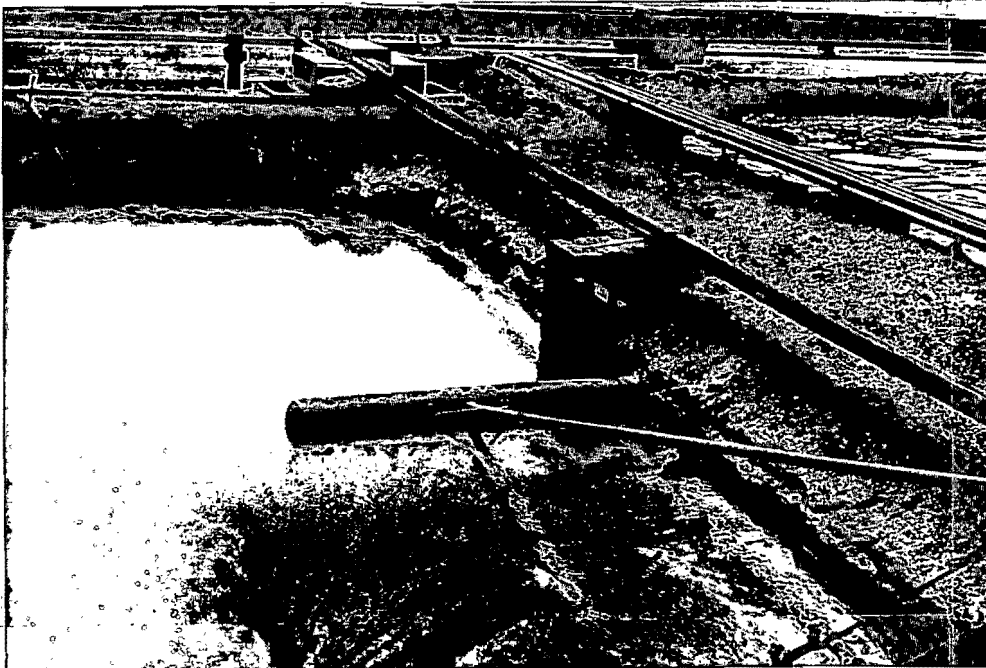
Chevron USA Hawaiian Refinery 11/12-13/86
North Surge Pond, facing west



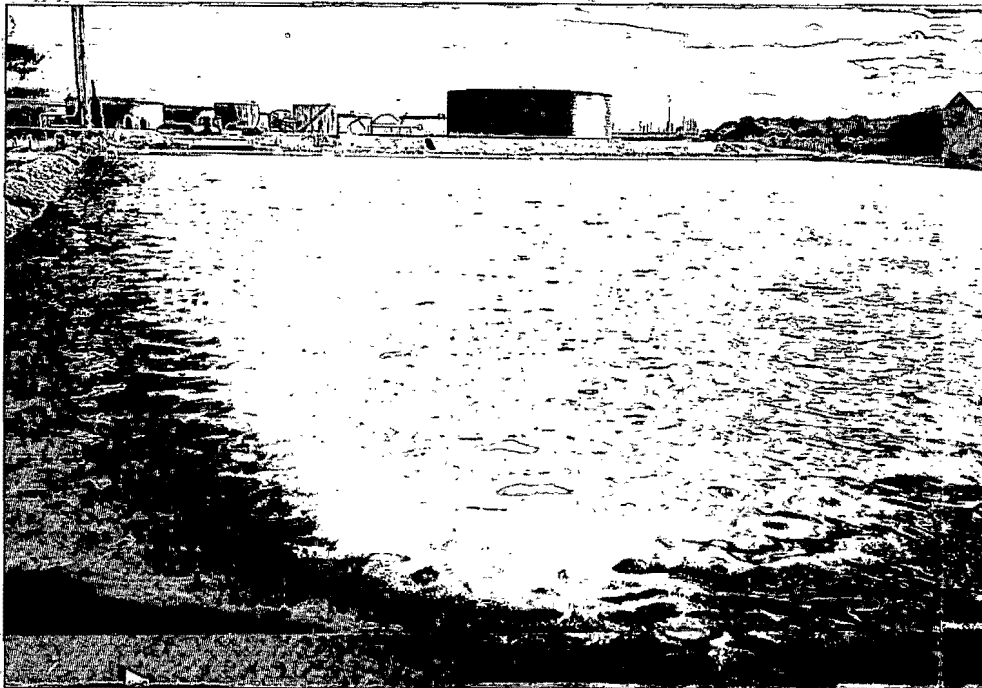
Chevron USA Hawaiian Refinery 11/12-13/86
South Surge Pond, facing southwest



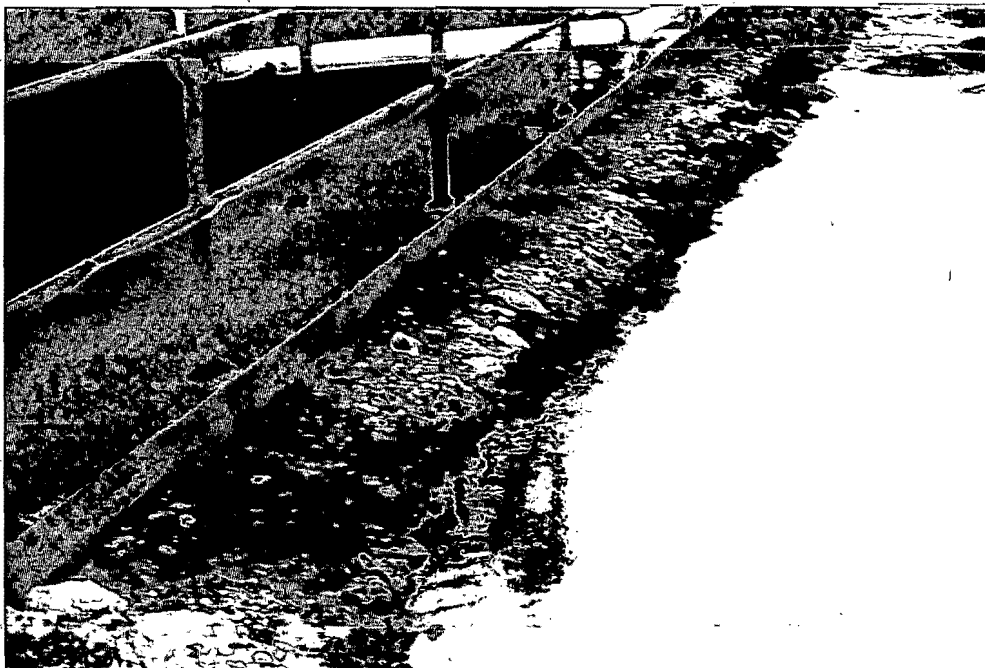
Chevron USA Hawaiian Refinery 11/12-13/86
Outfall Sump, facing southeast



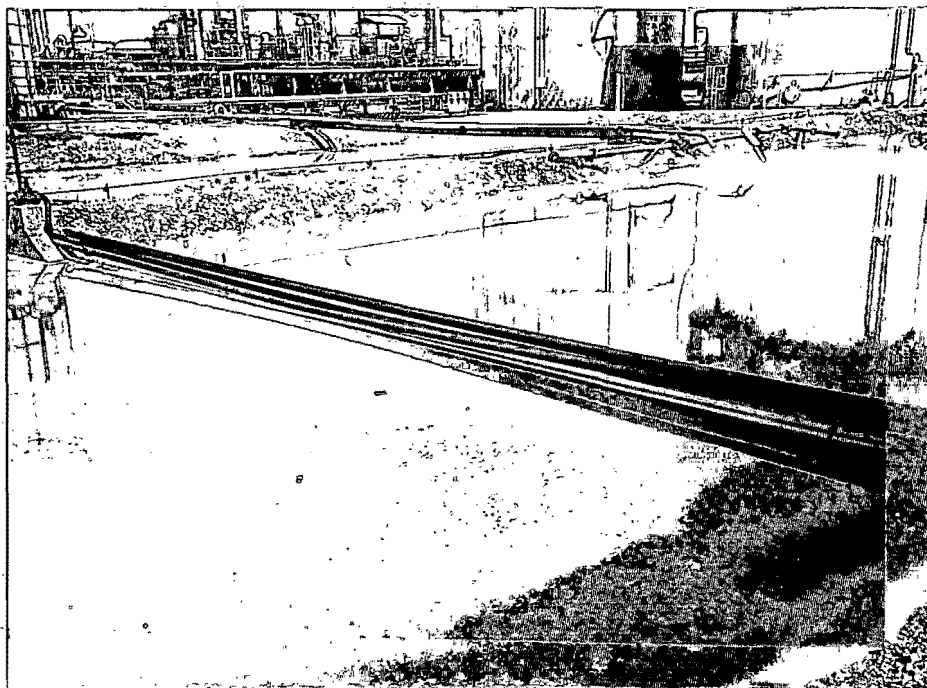
Chevron USA Hawaiian Refinery 11/12-13/86
Manual oil skimmer, South Surge Pond



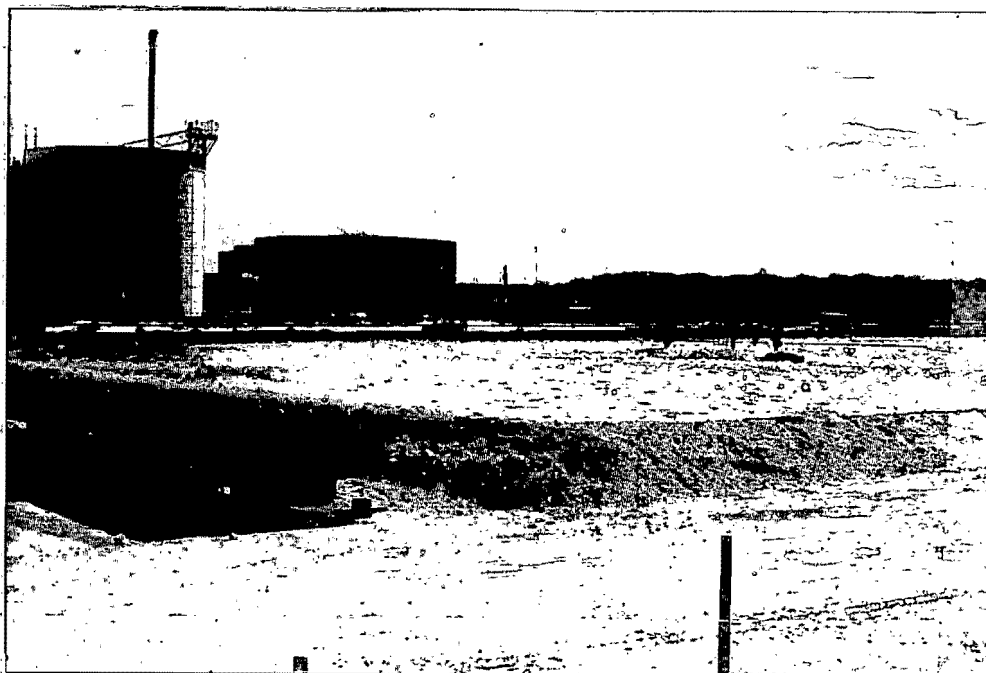
Chevron USA Hawaiian Refinery 11/12-13/86
Impounding Basin, facing east



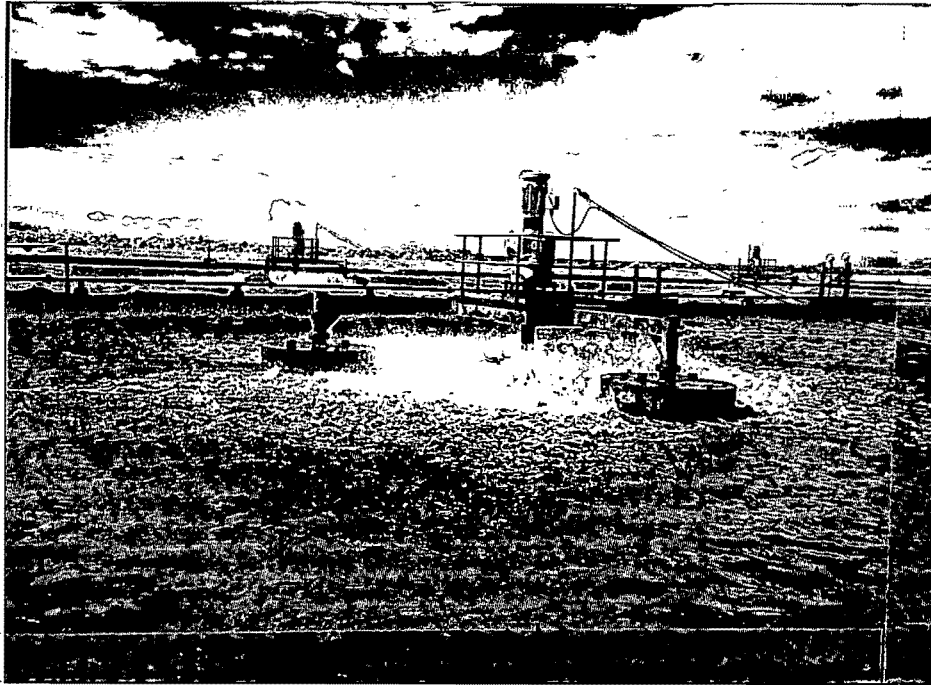
Chevron USA Hawaiian Refinery 11/12-13/86
Impounding Basin freeboard, north side



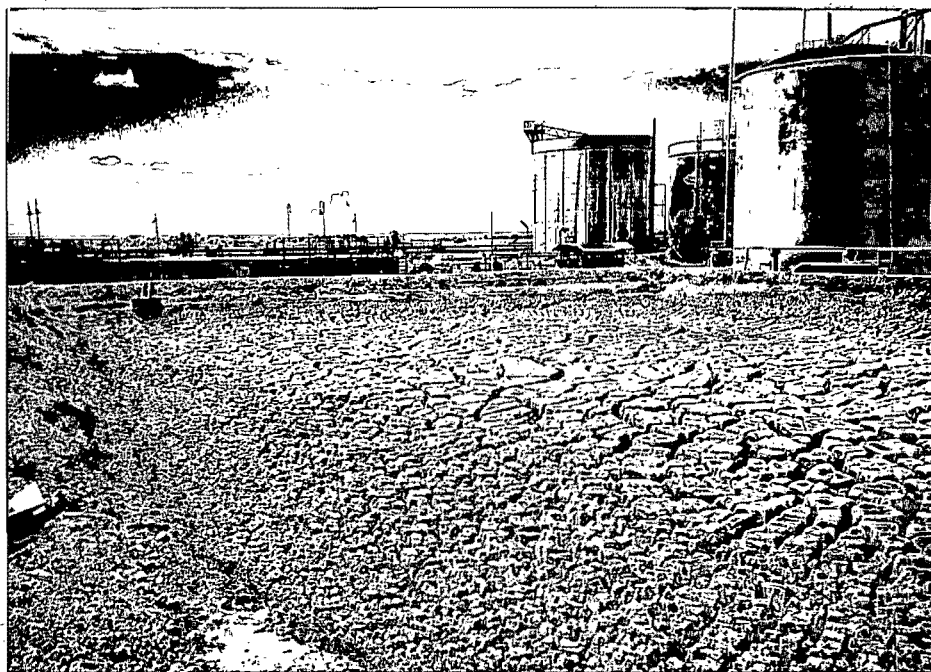
Chevron USA Hawaiian Refinery 11/12-13/86
Neutralization Basin looking northeast to Settling Basin



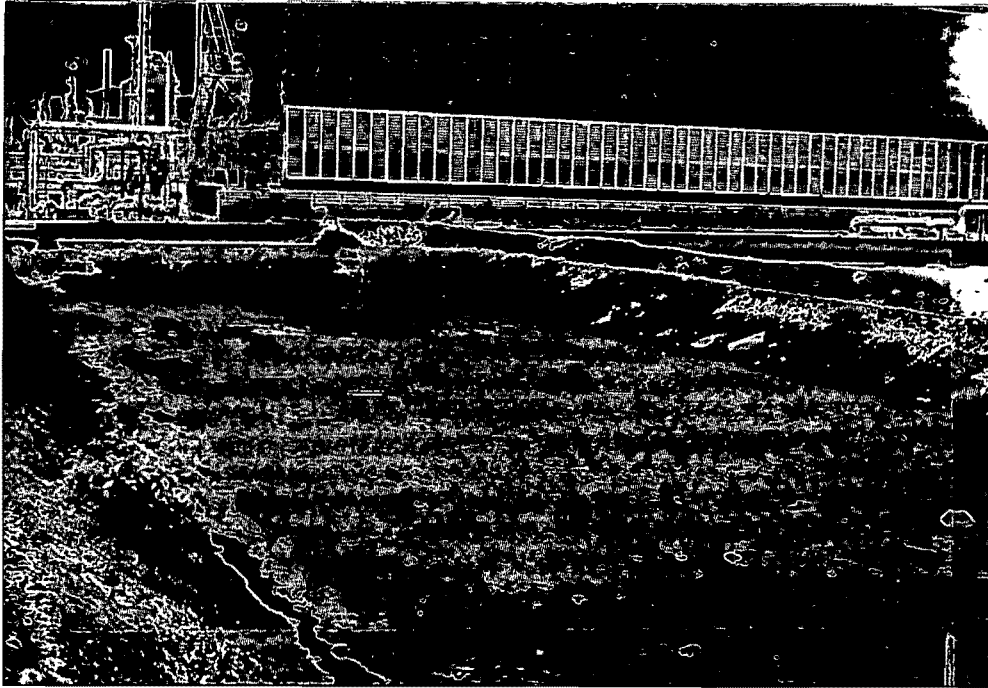
Chevron USA Hawaiian Refinery 11/12-13/86
Oxidation Pond 2/3 facing southeast



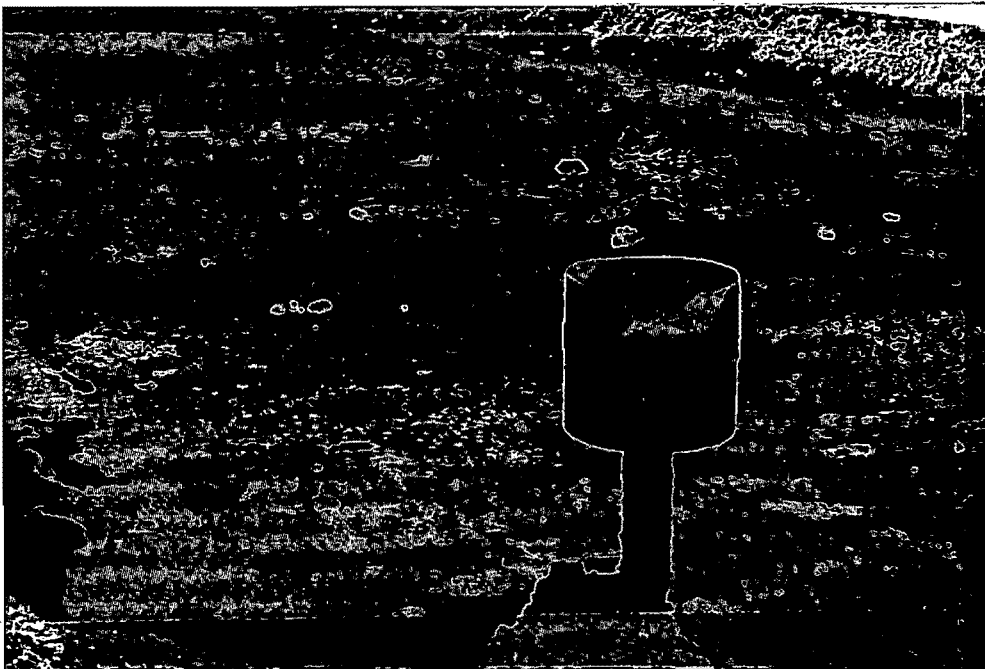
Chevron USA Hawaiian Refinery 11/12-13/86
Aerators, Oxidation Pond 1 facing west



Chevron USA Hawaiian Refinery 11/12-13/86
Flare Lime Basin Facing west



Chevron USA Hawaiian Refinery 11/12-13/86
Flare Oily Basin facing north



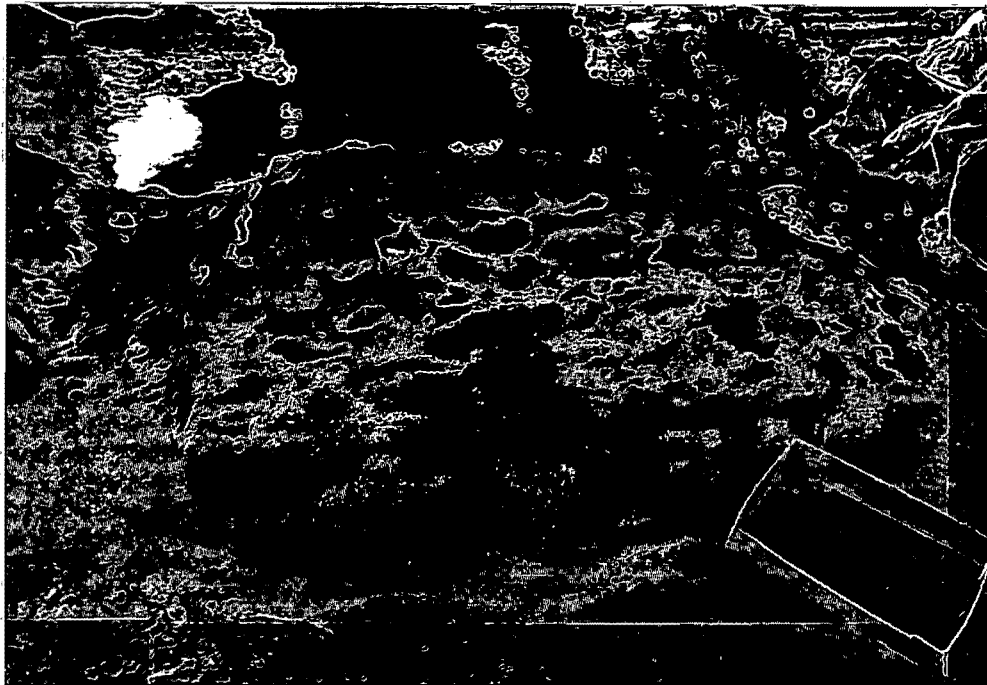
Chevron USA Hawaiian Refinery 11/12-13/86
Overflow pipe, Flare Oily Basin



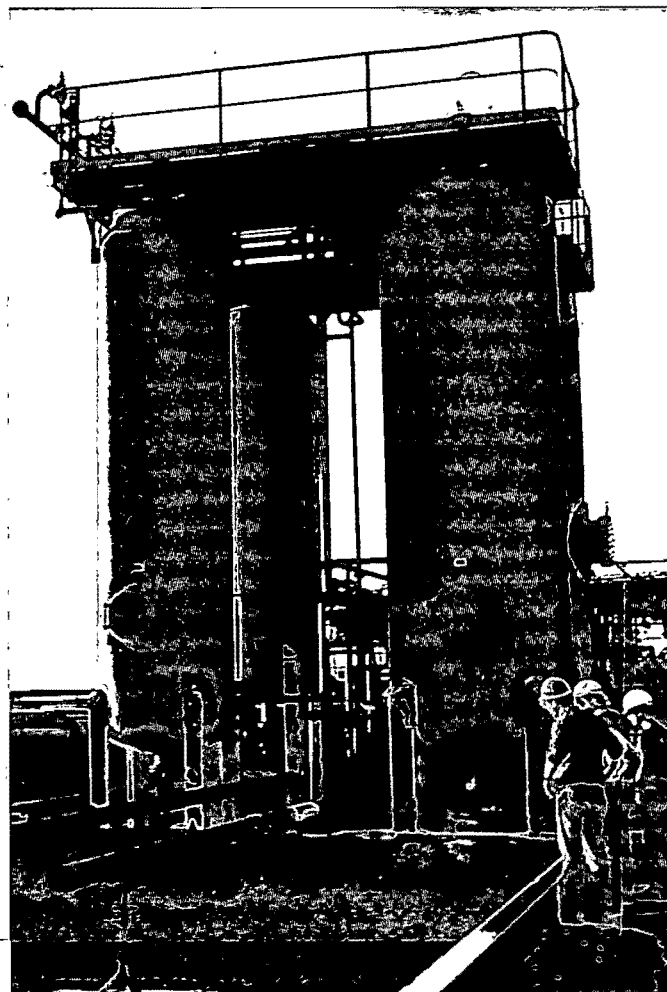
Chevron USA Hawaiian Refinery 11/12-13/86
Waste Pile C, facing south



Chevron USA Hawaiian Refinery 11/12-13/86
Discolored soil, Waste Pile A



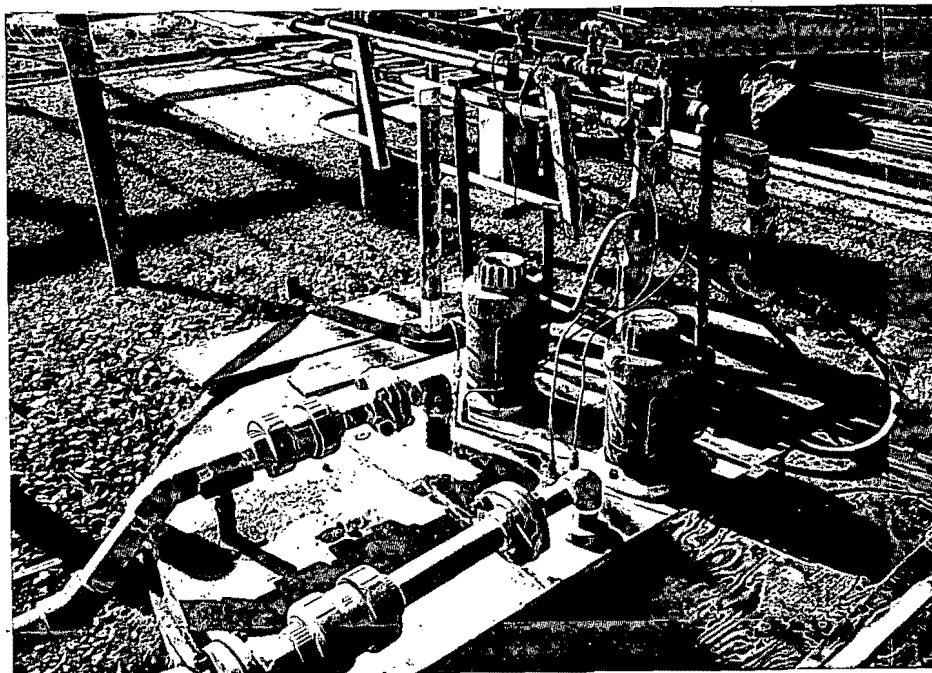
Chevron USA Hawaiian Refinery 11/12-13/86
Waste Pile C



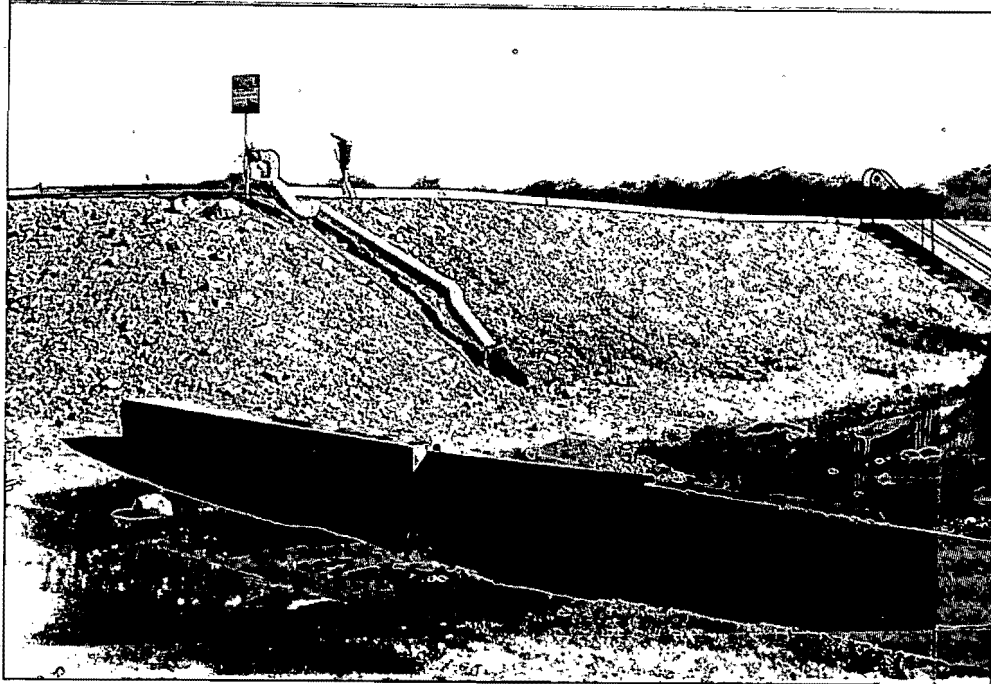
Chevron USA Hawaiian Refinery 11/12-13/86
Jet clay filters and Clay Dewatering Basin



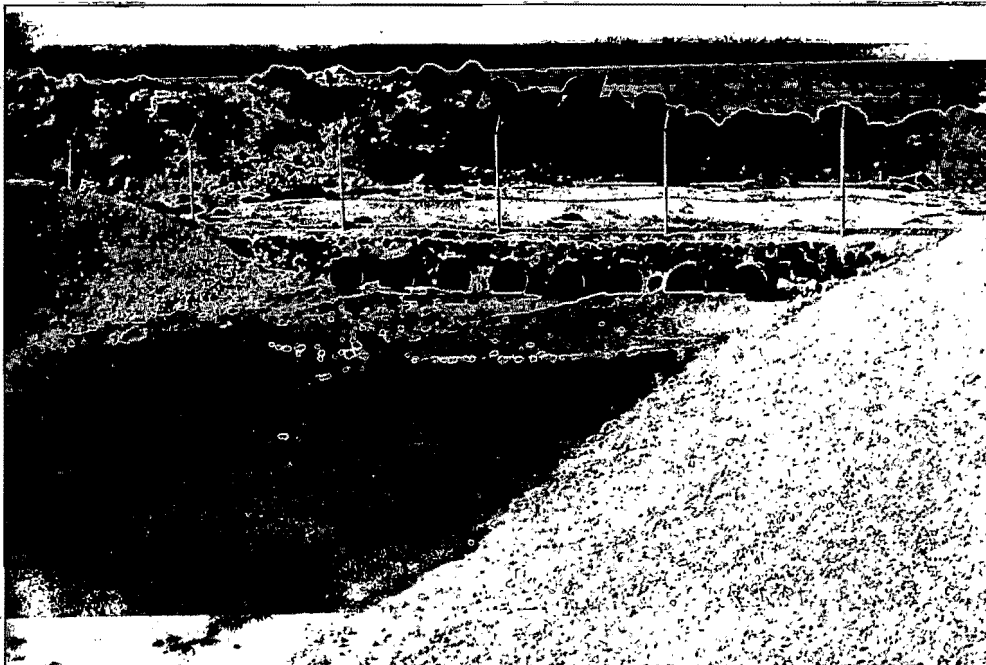
Chevron USA Hawaiian Refinery 11/12-13/86
Landfill B



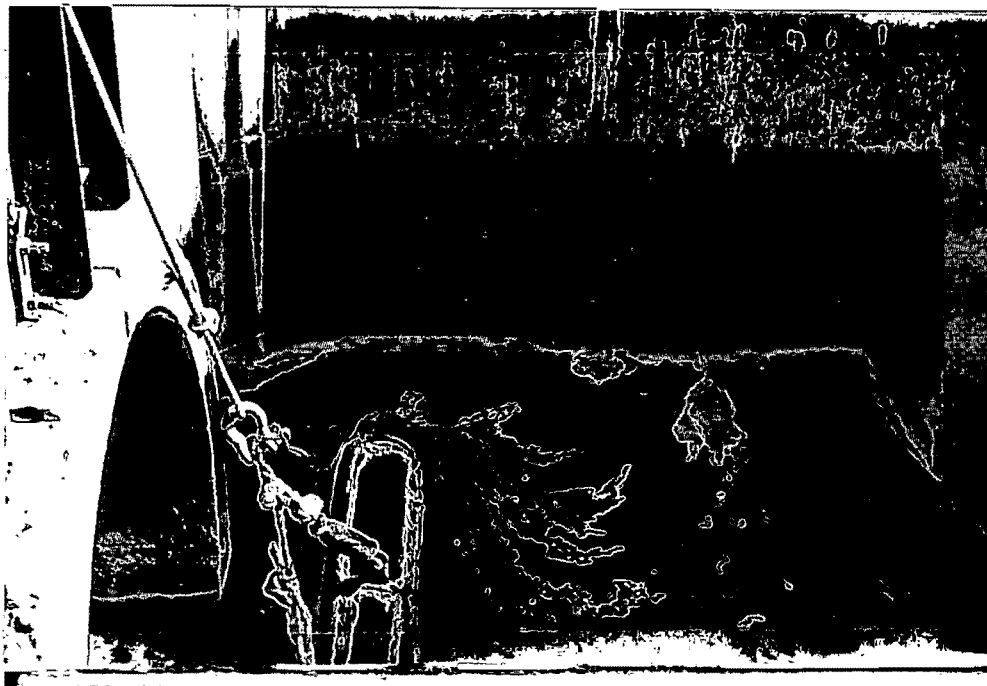
Chevron USA Hawaiian Refinery 11/12-13/86
Weak Acid Neutralization Sump



Chevron USA Hawaiian Refinery 11/12-13/86
Storm water drainage swale west of land treatment unit



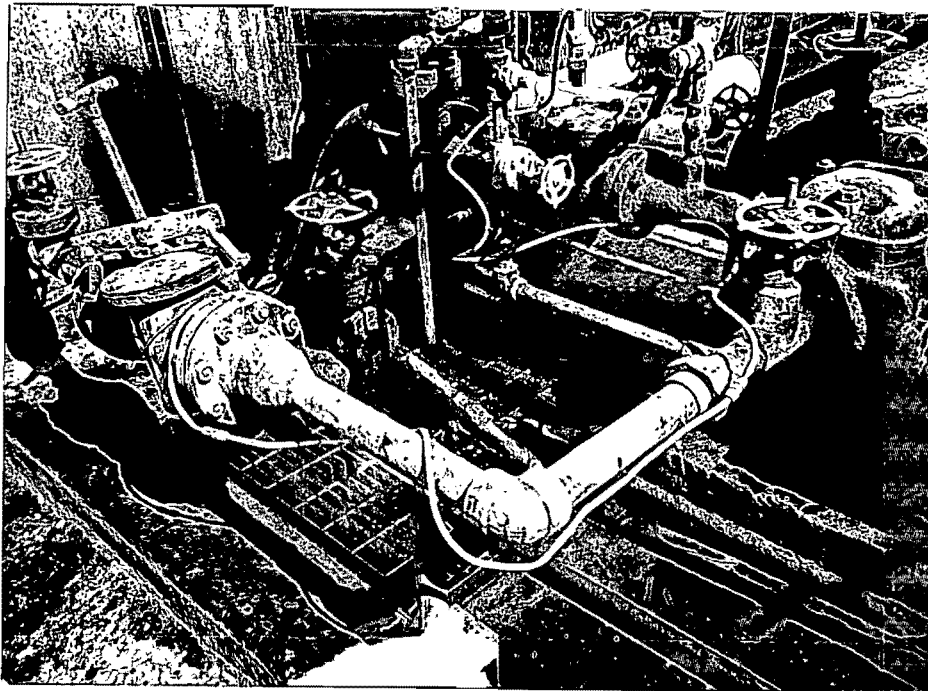
Chevron USA Hawaiian Refinery 11/12-13/86
Storm water drainage culvert



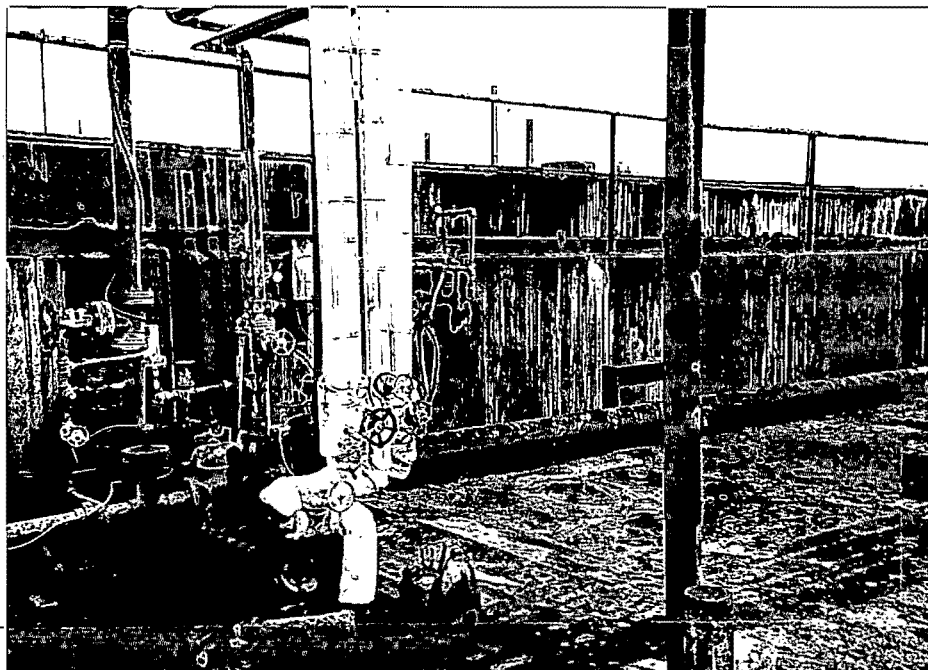
Chevron USA Hawaiian Refinery 11/12-13/86
Storm Bay



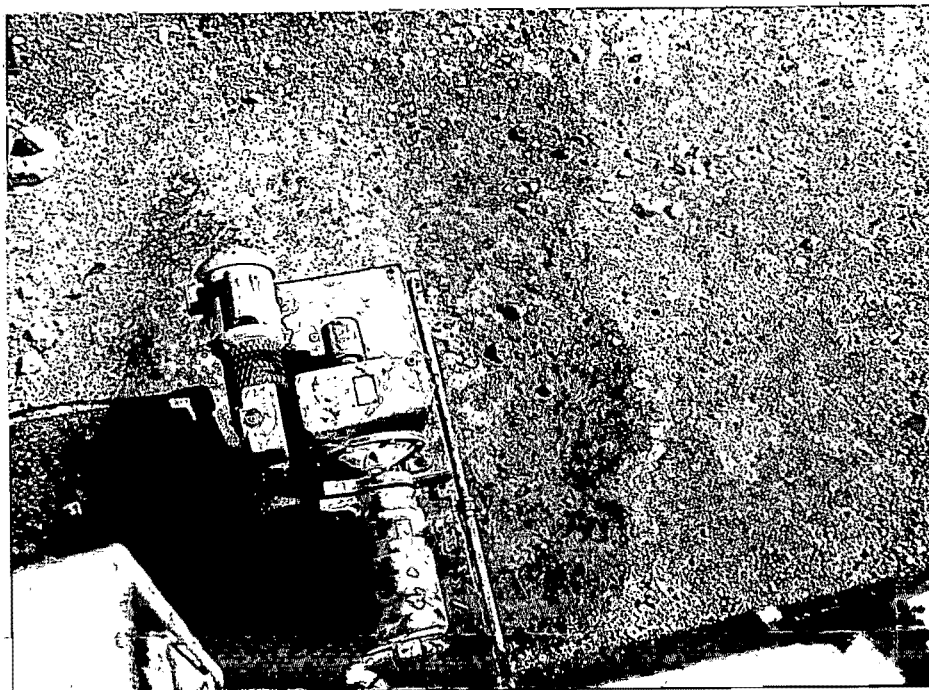
Chevron USA Hawaiian Refinery 11/12-13/86
Storm Bay



Chevron USA Hawaiian Refinery 11/12-13/86
Pumps and grate on south side of oil recovery box



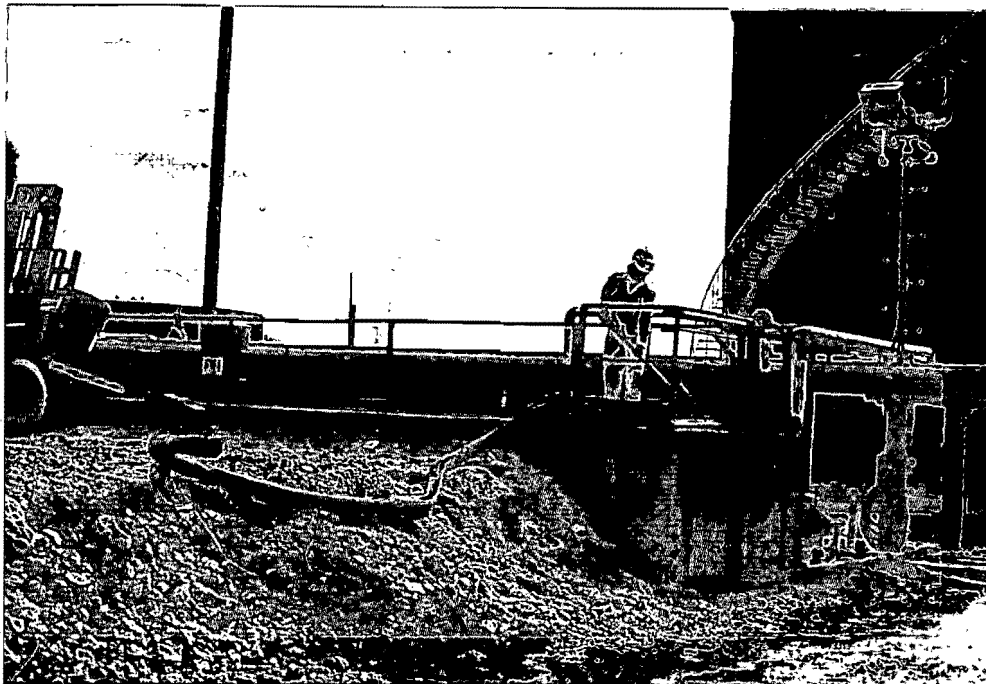
Chevron USA Hawaiian Refinery 11/12-13/86
South wall, oil recovery box



Chevron USA Hawaiian Refinery 11/12-13/86
Oily staining of soil, east side of API Separator



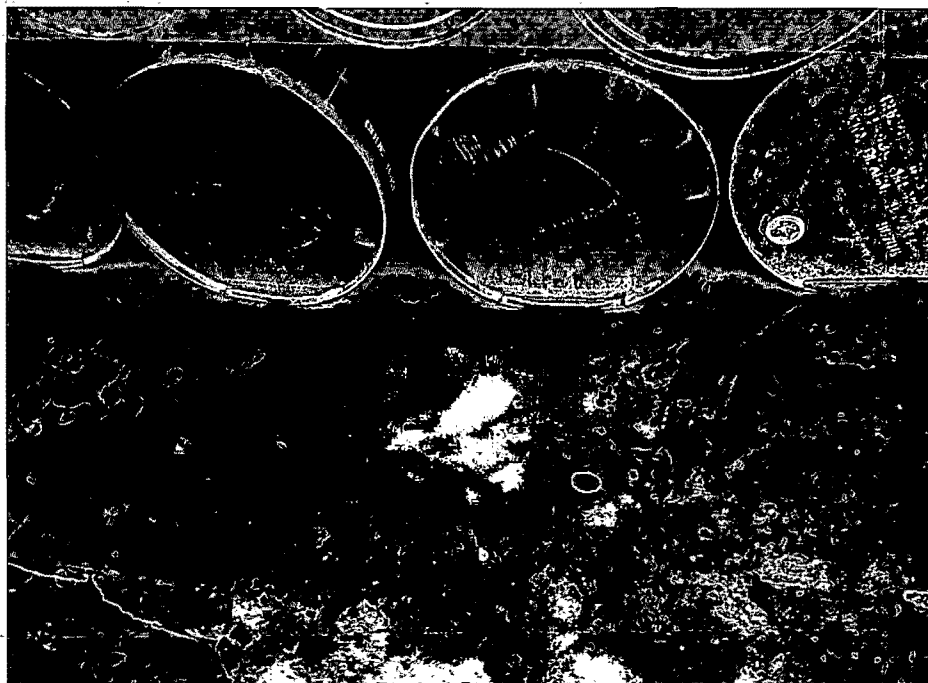
Chevron USA Hawaiian Refinery 11/12-13/86
Crack in API Separator wall



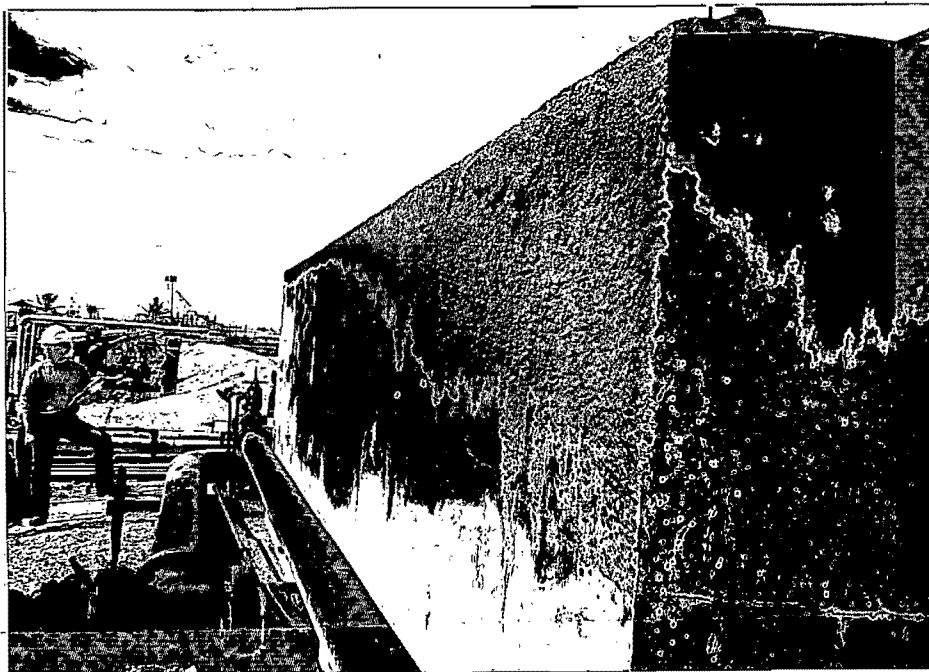
Chevron USA Hawaiian Refinery 11/12-13/86
Oil Recovery box, facing south



Chevron USA Hawaiian Refinery 11/12-13/86
Top of Oil Recovery Box



Chevron USA Hawaiian Refinery 11/12-13/86
Oily float on puddles - Drum Storage Area



Chevron USA Hawaiian Refinery 11/12-13/86
South wall - API Separator

N of ~~the~~ ^{light} ~~light~~ ^{but}
washwater tank
closed in 70's

Only Sump - head end of oily sump Pump
below grd. Could not determine depth
measures - 10 ft. concrete
water w/ oil inside
steel wall on W side w/ oil on
west side / possibly for dumping oil
Maybe sluice gate on W side of the
little unit 3 ft by ~ 12 ft
pumped to API

Junk yard - just N of acid plant
old heat exchanger unit
drum filled w/ ~~lava~~ solid fused hydrocarbon
on pallet, drum broken on side spilled on pallet
some on grd. Rust stains on grd

Kleen Blast
All Purpose Abrasive
Mission Blvd Hayward Calif
30100 (A.S.) 471-2100

64, 67
74, 75
89

Large Caballo

IAF put 1976

sulfur from startup of acid plant

Storm ^{bay} goes to N Surge Pond

85 analyses of
Settling Basin

Total
8 MI $< 2 \frac{\text{mg}}{\text{kg}}$

Total Cr
1.3 $\frac{\text{mg}}{\text{kg}}$

Going to get

Clay filter dumping \rightarrow municipal landfill

Searchardt - some clay filter may have gone to land treatment
boiler blowdown to acid sewer

weathering area bare grid

front end loader = 6' below grade. Sample, look
for lead. No EP Tox, AA lead
 $< 0.01 \text{ Pb}$

material scraped up, put into land treatment unit - 1980
when 1st or 2nd thing that went 10/20/80 K052
no sample of sluff put no

(N Ocean?)

Drain line from storm impoundment to storm bay grow flow
goes to N. Surge

Foul water oxidizer unit process

water comes in bottom
air goes up thru bottom
99% water coming off stack
Now, sow, 1 off stack

How are sludges removed from IAF and other impdments

cost dump
truck backing
scoop out
take to
'land treatment'

Pump diagrams for sludges + pond effluent

final Data for settling basin sludges, flare oily basin sludges

Has tankage property on S end been sold to HECO

barrels of asphalt - to
multibox in asphalt

Waste pile A near weathering area - any records on cleanup? (SWMU resp.)

check on ^{envr.} containment for foul/sow water tanks 303-304

construction drawings for neutr. sumps

Const. drawings for storm bay

Storm bay - where ~~are~~ are flows coming from? (to main box and side oily box). Let's check sewer drawing make sure we have areas served for all sewers and

Sampling info for weathering

none available
according to
lab supervisor

Fred Chang
roped off
not sure of
disposition of material
in weathering
no sampling wells

boiler water sludges aside from lime blowdown.

W S Ocean Ponds built in 1970's

Sampling Ocean ponds not normally done - only in un. cases

freedom in or ponds vis. checked daily

2nd 1/2 yr gao samples not taken yet

freq. of cleaning IAF - quarterly

IAF unit installed late 70's early 80's - flocculants yes.

Air into IAF - recycle sprayed in - induced

Sampling pt for NPDES on piping prior to its going underground after pumps.

no pump nr or pond - recovered

S surge pond - pump oil to sump.

liner in ox ponds - liner put in after construction - erosion resistance on berm walls only.

temp of neut. ponds - EP tox tested when it is cleaned.

SE corner of #3 ox pond - goes to impounding basin. (altho looked like its flush)

overflow oily + lime basin goes to ox pond.
last used oily flare basin ~ 6 mos ago. prob built in early 1970's

acid sumps - to acid sewer (neut. pond)

catalyst times H 63 black - nickel on silica EP Tox

H 61 blue - cobalt moly nickel on alumina

FCC catalyst alumina, oxide + silica

Promotor - mid 70's - prob when CO boiler

rain gauge - 1.69" rain.

CO boiler is boiler

ox ponds originally just settling basins
neut pit + settling basin 1960

lime + oily basin → mid-late 70's

Gary Guthrie

2 columns

water goes in top.

air oxidizes sulfides route to flue gas regenerator to FCC

99%

NO₂, SO₂, CO₂

steam strip of for ammonia

goes

4.1 LAND TREATMENT UNIT

4.1.1 Information Summary

Unit Description: The land treatment unit is 3.1 acres in size, and consists of three bermed cells. (6-confidential, 9) The unit was constructed by leveling and compacting the coral base, installing dikes made of compacted coral and importing clean fill for treatment zone soil. (8)

Dimensions?

Dike height? 6 ft
Depth of unit? 8" of sludge

Date of Startup: The unit was constructed in 1980. (3, 12)

Date of Closure: This is an active unit. (12)

Wastes Managed: Wastes managed in the land application area include API separator sludge, non-leaded tank bottom sludges, DAF float, jet fuel filter media, oily soil, heat exchanger bundle cleaning sludge and non-RCRA regulated materials. (1, 3, 6-confidential)

Release Controls: Lysimeters and groundwater monitoring wells have been installed near the treatment unit. (3, 9) The unit is inspected weekly. (12)

History of Releases:

Lysimeter - don't get much liquid
(5)

4.1.2 Conclusions

Groundwater Release Potential: Groundwater releases from this unit are regulated under RCRA.

Where are wells?

Surface water release potential:

How many
Depth, SCREEN ZONE?

Air release potential:

Results, frequency
of sampling?

Subsurface gas release potential:

4.1.3 Further action required

Leaded Weathering area

4.2 INACTIVE LAND TREATMENT AREA (Also known as Site X)

4.2.1 INFORMATION SUMMARY

Unit description: An area measuring approximately 50 feet by 70 feet was used to treat leaded tank bottoms. The area was located directly south of Tank 232. The unit consists of an open area of compacted coral.(5)

Current disposition new ~~to~~ ~~EP~~ bulks bags bare grd

Date of Startup: Unknown. *Startup? prob early 60's*

Date of Closure: The area was taken out of service in 1980, when the upper layers of material and some underlying coral were removed. Samples of the remaining strata passed an EP Toxicity test, according to the facility.(5)

Test results? will left for us

Wastes Managed: Leaded tank bottoms were "weathered" in this area.(5)

Release Controls: *Any monitoring wells? check map.*

History of Releases:

4.2.2 Conclusions

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4.2.2 FURTHER ACTION REQUIRED

4.3 API SEPARATOR

4.3.1 INFORMATION SUMMARY

Unit Description: The API separator is 22 ft wide by 70 ft long by 6 ft high and is divided into two cells.(7) Oil from the separator is discharged to the recovered oil system and water is routed to the wastewater treatment system.(7)

Concrete
Construction material?

Above or below ground? above
Liner? no

Date of Startup: Unknown. Startup?

Date of Closure: This is an active unit.(7,9)

trail of paddles
run by motor
lots of oil
leakage around motor

Wastes Managed: The separator receives process wastewaters and other oily water from refinery operations which have been routed through the oily sewer system.(8) Results of analyses on the API sludge are shown in Table __.(9) The sludge is a defined hazardous waste, Waste No. K051.

Release Controls: The separator is inspected weekly for evidence of leakage or cracking of the structure.(12)

Any wells nearby yes

History of Releases:

1 to 6 ft E

4.3.2 Conclusions

Groundwater Release Potential:

cracks in concrete
leaking to outside

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.3.3 Further action required

4.4 NORTH SURGE POND

4.4.1 INFORMATION SUMMARY

Unit Description: The north surge pond is located south of the neutralization pond. It has a capacity of 160,000 gallons, and measures 110 ft by 40 ft.(7)
It is not lined.(8) It is not RCRA regulated.(12) *Depth?*

Date of Startup: Unknown. *Startup?*

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond receives storm water runoff prior to its treatment in the oxidation ponds.(7)

Release Controls: It is not known whether release controls exist for this unit. *Above or below ground?*

History of Releases: *Any evidence of overflow?*
Dike integrity? ok

*water - some oil float
some oil stains on side*

2 ft freeboard

4.4.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.4.3 Further action required

4.5 SOUTH SURGE POND

4.5.1 Information Summary

Unit Description: The south surge pond is an unlined 0.16 acre surface impoundment which is used as an equalization basin.(8)

Date of Startup: Unknown. *Startup?*

Date of Closure: This is an active unit.(8)

Wastes Managed: The pond receives effluent from the API separator.(8,12)

Results of metals analyses on pond sludge are shown in Table __.(9)

Release Controls: The pond is inspected daily to ensure that two feet of freeboard are maintained at all times.(12)

History of Releases: *Evidence of overflow? Dike height ft? appearance?*

4.5.2 Conclusions

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4.5.3 Further action required

See Dots

20 x 60?

*Depth?
Dimensions?*

*has oil collection
bore at NW end
concrete sump*

*oily thick material
~ 2 ft freeboard
hand skimmers*

4.6 OXIDATION PONDS

4.6.1 Information Summary

Unit description: There are two mechanically aerated oxidation ponds on the Chevron Hawaiian Refinery site.(8) They are lined only with compacted coral (6-confidential) Oxidation Pond 1 is 0.7 acre in size and contains three barge-mounted floating aerators. Oxidation Pond 2/3 covers 1.26 acres and consists of two ponds separated by a curtain wall, with each section being served by one floating mechanical aerator.(8,12) These ponds are RCRA regulated.(12) *Dimensions?*

Date of Startup: Unknown. *Startup?*

Date of Closure: The ponds are active units.(9)

Wastes Managed: Effluent from the north and south surge ponds discharges into the oxidation ponds. The effluent contain phenols, oil sulfides and ammonia.(8) The results of pond sludge analyses are shown in Table __.(9) Although Chevron has disputed this, EPA considers the pond sludges to be a listed hazardous waste due to similarity with API separator sludges.(12)

Release Controls: The ponds are inspected daily to verify that that there is a minimum 2 feet of freeboard.(9,12) The overflow weir and sluice valve are inspected weekly. *Dike height*
confirm freeboard?

History of Releases: *Evidence of releases?*
Monitoring wells?

4.6.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

4.7 Neutralization Tank

4.7.1 Information Summary

Unit Description: According to Chevron, the unit meets the definition of a tank as defined under 40 CFR 260.10.(12)

Construction?

Size?

Location?

Date of Startup: Startup?

Date of Closure: Is it active?

Wastes Managed: Prior to discharge to the neutralization basin, potentially corrosive waste streams are neutralized in this tank.(12)

Release Controls: Tank containment?

History of Releases: Any evidence of overflow? Leaks?

4.7.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.7.3 Further Action Required

How are wastes neutralized?

Sources of wastes?

pH of wastes?

4.8 Neutralization Basin

4.8.1 Information Summary

Unit Description: The neutralization basin is located between the settling basin and the north surge pond. It measures 110 ft by 40 ft and has a capacity of 160,000 gallons.(7) *Construction*
Depth?

Date of Startup: Unknown. *Startup?*

Date of Closure: The basin is an active unit.(7)

Wastes Managed: The basin receives potentially corrosive waste streams from refinery operating units which have been neutralized in the neutralization tank to a pH between 2 and 12.5 prior to discharge to the basin. Low pH waste streams are mixed with lime slurry in the basin for secondary neutralization to a pH between 6.0 and 8.0.(7)

Release Controls:

History of Releases:

4.8.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.8.3 Further Action Required

4.9 Settling Basin

4.9.1 Information Summary

Unit Description: The settling basin is located north of the neutralization pond, and measures 110 ft by 40 ft with a capacity of 160,000 gallons.(7)

Date of Startup: Unknown.

Startup?

Depth?

Date of Closure: This is an active unit.(7)

Wastes Managed: The settling basin receives neutralized effluent from the neutralization pond. Its purpose is to provide additional residence time for lime solids to settle out.(7)

Release Controls: Dike height?

History of Releases:

4.9.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.9.3 Further Action Required

What happens to lime solids?

4.10 IMPOUNDING BASIN

4.10.1 Information Summary

Dimensions?

Unit Description: The impounding basin is a 2.3 acre impoundment used as a settling basin. Effluent from the basin flows to an induced air flotation (IAF) unit for algae removal.(8) This is a RCRA regulated unit, although Chevron disputes that sludge in the basin is a hazardous waste.(12)

Construction?

Date of Startup: Unknown. ~ 1960

Date of Closure: This is an active unit.(8)

Wastes Managed: The impounding basin receives effluent from Oxidation Pond 2/3, settling basin effluent and cooling tower blowdown.(8,12) Results of basin sludge analyses are shown in Table __.(9) The basin serves two functions: allowing additional settling of suspended solids, and providing surge capacity for the wastewater treatment system.(12)

Release Controls: The impounding basin is inspected regularly to ensure that it is in good operating condition and that two feet of freeboard are maintained.(9,12)

History of Releases: Evidence of overflow?
Release controls?

and pl...

4.10.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.10.3 Further Action Required

What happens to sludges?

4.11 IAF UNIT

4.11.1 Information Summary

Unit Description: The IAF, or induced air flotation unit, removes algae from influent flows from the impounding basin.(8) According to Chevron, the IAF unit is exempt from RCRA regulation since it meets the definition of a tank and it is part of an Effluent Water Treatment System regulated under Section 402 of the Clean Water Act.(12)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(8)

Wastes Managed: The IAF unit receives effluent from Oxidation Pond 2/3, settling basin effluent, and cooling water from the cooling tower which have undergone settling in the impounding basin.(8,9)

Release Controls: The unit is inspected regularly to ensure proper operational condition.(12)

History of Releases:

4.11.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.11.3 Further Action Required

Construction?

Dimensions?
Volume?

Startup? when?

Signs of leaks?

4.12 IAF POND

4.12.1 Information Summary

Unit Description: The IAF, or induced air flotation pond is located at the far southwest corner of the refinery. It is 11 ft wide by 52 ft long and 6 ft high.(7) The pond is not lined.(9)

Date of Startup:

Date of Closure: This is an active unit.(7)

Wastes Managed: The IAF pond receives float from the IAF unit and partially dewateres it. Results of analyses on the IAF float are shown in Table __.(9) Decanted effluent is directed back into the impounding basin.(8)

Release Controls: Pond levels are checked daily to ensure that two feet of freeboard are maintained at all times.(12)

History of Releases: *Dikes?*
Signs of release?

4.12.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.12.3 Further Action Required

what happens to sludge?

4.13 TEMPORARY SURFACE IMPOUNDMENTS

4.13.1 Information Summary

Unit Description: Two temporary surface impoundments were operated at the site. They measured 45 feet by 80 feet, and 60 feet by 100 feet.(5) Above grade? Location?

Date of Startup: Unknown. Startup? 3/1/82 - 8/1/82

Date of Closure: The two impoundments were removed in 1982.(5) Sampling? How closed?

Wastes Managed: Jet fuel impregnated filter clays were managed in these two areas.(5) other wastes?

Release Controls: Any?

History of Releases:

4.13.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.13.3 Further Action Required

Same as Clay dewatering imp.

4.15 WASTE PILE AREA

4.15.1 Information Summary

Unit Description: The area is constructed of cement blocks, and is used for cleaning tank bottoms and general waste evaporation purposes.(6-confidential)

Date of Startup: Unknown. ?

Date of Closure: Unknown. ?

Wastes Managed: Tank bottoms and other unspecified wastes are managed in this area.(6-confidential) What "other" wastes?

Release Controls: It is not known whether release controls exist for this unit. Release?

History of Releases: ?

4.15.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.15.3 Further Action Required

Lead of 100 ft
Location?

Sub 100 ft
100 ft

Water used for
waste management
area
Construction
area

4.16 OLD SURFACE IMPOUNDMENT AREA

4.16.1 Information Summary

Unit Description:

*Location
Description?*

Date of Startup: Unknown. ?

Date of Closure: Unknown. ?

Wastes Managed: This area may have been used for soda ash
neutralization.(6-confidential)

Release Controls:

History of Releases:

4.16.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.16.3 Further Action Required

*2nd floor
7.19.00
11 P*

*could be good
could be good
if not fit*

4.17 CLEANING AND DISPOSAL IMPOUNDMENTS

4.17.1 Information Summary

Unit Description: The two impoundments have coral bottoms and are bermed. (6-confidential) *Dimensions?*

Location?

Dimensions?

Volume?

Date of Startup: ?

Date of Closure: ?

Wastes Managed: The impoundments are used for cleaning of plant ^{acid} tanks and for disposal of fullers earth and jet fuel from ^{cleaning} process filters. (6-confidential) (ash used for both?)

Release Controls: Dikes?
Height conditions

History of Releases: Evidence of releases?

4.17.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.17.3 Further Action Required

~~SECRET~~

4.18 DRUM STORAGE AREA

4.18.1 Information Summary

Unit Description: The drum storage area is located east of the north ocean pond. Its dimensions and capacity are unknown.(7) A 1986 RCRA TSD Investigation noted chemical stains on the ground next to rows of drums in the storage area.(11)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7)

Wastes Managed: Wastes in this area include empty lubricating oil and chemical drums which are being accumulated until they are shipped off-site for recycling. Any drums which have held acutely hazardous chemicals as defined by 45 FR 33122 are triple rinsed at the operating units prior to being placed in this storage area. Triple rinsing of these drums was instituted in 1984.

Where are drums rinsed?

Release Controls: *Banned? Drainage? flat area*

History of Releases: *Look for stained grd.*

4.18.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.18.4 Further Action Required

still on bare grd?

probably actual but no waste
Nalco - (and) read label
fine white powder
1 w/ wood over top
W.R. Ginc

Some magnets stained soil and starting red oil on standing water around drums

Some very old drums
all have yd
full
NAED

Still full drums labeled
as being black
drums labeled - methyl acetate
chloroethane
propylene dichloride

4.19 SULFURIC ACID/AMINE PLANT PONDS

4.19.1 Information Summary

Unit Description:

Location
Number 1?

Date of Startup: ?

Date of Closure: ?

Wastes Managed:

Release Controls:

History of Releases:

4.19.2 CONCLUSIONS

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.19.3 Further Action Required

*N of amine/acid plant
old pond*

*Dimensions? unknown
Construction?
Above ground?*

*wastewater
to tanks
final waste water
to pond*

*Unknown
10 yrs ago?*

Wastes here?

Diking? unknown

*Previous? and there
Current Evidence? base area*

4.20 FLARE OILY BASIN

4.20.1 Information Summary

Dimensions?

Construction?

Unit Description: The flare oily basin has 0.24 acres in surface area.(9)

Location?

Date of Startup: Unknown. Startup?

Date of Closure: According to a December, 1985 inspection, this unit is no longer in use and will undergo closure.(10)

Closed yet?

Use stopped when?

Wastes Managed: This basin receives oily skimmings from the oxidation ponds and other oily wastes, such as oil spill material.(2,9) API separator sludge may also have been placed in the basin.(9) Analysis of sludge from the flare oily basin detected toluene at 2 ppm, chrysene at 20 ppm, and fluorene at 20 ppm. Appendix VIII metals were below Total Threshold Limit Concentrations (TTLC).(9) Results of analyses are shown in Table __.(9)

API sludges here?

Release Controls: It is not known whether release controls exist for this unit. Release controls?

History of Releases: Evidence of releases?

4.20.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release potential:

Subsurface Gas Release Potential:

4.20.3 Further Action Required

4.21 FLARE LIME BASIN

4.21.1 Information Summary

Unit Description: The basin is located east of the API separator and south of the cooling tower, and measures 110 ft by 80 ft with a capacity of 350,000 gallons.(7) It is not a RCRA regulated unit.(2) A 1986 RCRA TSD investigation noted that the basin was leaking along the side of its dike.(11)

Date of Startup: Unknown.

Startup?

Date of Closure: The basin is an active unit.(7)

Wastes Managed: The basin is used to dry alkaline lime sludge that has been removed from the acid/amine/ boiler blowdown neutralization ponds.(2)

Release Controls:? It is not known whether release controls exist for this unit.

History of Releases:

Evidence of release?

4.21.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.21.3 FURTHER ACTION REQUIRED

Dike height?

Depth?

4.24 CARBON MONOXIDE INCINERATOR

4.24.1 Information Summary

Unit Description:

Date of Startup: Unknown.

Date of Closure: Unknown.

Wastes Managed: The incinerator burns effluent gas from the Fluid Catalytic Cracker to complete combustion.(4)

Release Controls: It is unknown whether release controls exist for this unit.

History of Releases:

4.24.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.24.3 Further Action Required

*Location? In boiler plant
Construction?
Dimensions?
metal airborn
concentrations
of lead etc.*

Dates of service?

Release controls?

*Eight years in
operation
CO levels
predicted
Cat Cracker*

4.25 ELECTROSTATIC PRECIPITATOR--FLUID CATALYTIC CRACKER

4.25.1 Information Summary

Unit Description:

Date of Startup:

Date of Closure:

Wastes Managed: This unit controls dust emission from the Fluid Catalytic Cracker effluent gas.(4)

Release Controls:

History of Releases:

4.25.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.25.3 Further Action Required

*Location? H and G +
Construction?
Structure - particulate
filter, baffles*

Dates of service? 6/1-6/2

*How does it work? ← takes particulate out
of catalyst
feed back to
catalyst
Monitoring?
No accumulation of
particulate
CO levels*

4.26 LANDFILL A

4.26.1 Information Summary

Unit Description: Landfill A is located south of the sewer sludge impoundment. Its dimensions and capacity were stated to be unknown in the facility's SWMU response letter.(7)

Date of Startup: Unknown.

Startup? unknown

Date of Closure: The landfill was taken out of service and graded in 1984.(7)

Wastes Managed: Wastes placed in the landfill included Fluid Catalytic Cracker catalyst fines (regenerated), clay treater spent clay, and lime blowdown.(7)

Release Controls:

Any?

History of Releases:

Any monitoring?
Sampling?

4.26.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.26.3 Further Action Required

Find on map?
LTS area
bordered

monitoring location
area: water pond
slight discoloration
of soil

along road
This color is typical
of soils from
island - may have
been present as
fill

4.27 LANDFILL B

4.27.1 Information Summary

Unit Description: Landfill B is located in the northwest section of the plant property.(7)

Date of Startup: 1978.(7)

Date of Closure: No disposal has taken place in this area since 1982.(7)

Wastes Managed: Landfill B was used to dispose of various materials , including trees cleared from the site, asphalt and dirt from asphalt spill cleanup, and an asphalt roof which was damaged during a 1981 hurricane.(7)

Release Controls:

History of Releases:

4.27.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.27.3 Further Action Required

Like pile
Volume?
Dimensions?
Size of material

Any chemicals or sludges?

Any sampling or monitoring?

Don't know

2/ 1981
1/ 1981
1/ 1981
1/ 1981
1/ 1981

asphalt roof
asphalt spill
asphalt

4.28 Clay Dewatering Impoundment

4.28.1 Information Summary

Unit Description: This impoundment measures 45 ft x 80 ft, and is located west of the crude distillation unit and the clay dewatering basin. It has a capacity of about 50,000 gallons.(7)

Date of Startup: Unknown.

Find on map?
Depth?
Date of startup?

Date of Closure: The clay and some surrounding soil was removed in 1982.(7)

Wastes Managed: Clay treater spent clay was dewatered and weathered at this site a few times prior to 1980.(7)

Release Controls: It is unknown whether release controls exist for this unit.

History of Releases:

Freeboard?

Sampling?

Monitoring?

4.28.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.28.3 Further Action Required

*old imp. tank
had been
covered over
by a concrete slab
also pit where
lines were run
into lab. tank
to be a 4.5 ft*

4.29 Sewer Sludge Impoundment

4.29.1 Information Summary

Unit Description: The sewer sludge impoundment is located south of the clay dewatering impoundment. Its dimensions are 100 ft by 60 ft, with a capacity of 100,000 gallons.(7)

Date of Startup: Unknown.

Date of Closure: Sludge and some soil were removed to the land treatment unit and the area regraded in 1982.(7)

Wastes Managed: Wastes placed in this impoundment included amine column and vessel sludges and wash water.(7)

Release Controls: It is unknown whether release controls exist for this unit.

History of Releases:

4.29.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.29.3 Further Action Required

Find on map - ok

Depth?

water level

Startup? unknown

Constituents?

Dikes?

sampling or monitoring?

Regraded
Area
W of primary
nothing in sec

4.32 LPG AREA COOLING WATER POND

4.32.1 INFORMATION SUMMARY

Unit Description: The cooling water pond located along the fence line at the north end of the Chevron property. It has a capacity of about 1,200,000 gallons and measures 85 ft by 1,100 ft.(7)

Date of Startup: Unknown.

Startup?

Date of Closure: The pond was taken out of service and regraded in 1982.(7)

Wastes Managed: Wastes in this pond included once-through brine cooling water from the LPG refrigeration compressors.(7)

Any sampling?
Constituents?

Release Controls:

Diked? unknown

History of Releases:

4.32.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.32.3 Further Action Required

4.33 South Ocean Pond

4.33.1 Information Summary

Unit Description: The south ocean pond is located along the west fence line at the south end of the refinery. It measures 90 ft by 240 ft and has a capacity of 900,000 gallons.(7)

Date of Startup:

Startup?

Date of Closure: The pond is an active unit.

Wastes Managed: The pond is used during heavy rains to temporarily hold storm water. The water is held until it can be routed back to the wastewater treatment plant during lower flows.(7)

Depth?
Construction?
Constituents?

Runoff from what areas?

Release Controls:

Diked?

History of Releases:

Any past?

4.33.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential: Due to the nature of this unit and the wastes it receives, there is no potential for subsurface gas generation.

4.33.4 Further Action Required

4.34 North Ocean Pond

4.34.1 Information Summary

Unit Description: The north ocean pond is located north of the south ocean pond along the west fenceline of the refinery. It measures 90 ft by 970 ft and holds 3,500,000 gallons.(7)

Date of Startup:

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond serves the same function as the south ocean pond, holding storm water runoff during periods of high rainfall until the water can be routed back into the wastewater treatment system during periods of lower flow.(7)

Release Controls:

History of Releases:

4.34.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential: Due to the nature of this unit and the nature of the wastes it receives, there is no potential for generation of subsurface gas.

4.34.3 Further Action Required

4.35 Waste Pile A

4.35.1 Information Summary

Unit Description: Waste Pile A is located west of Landfill B. The dimensions and capacity of the waste pile are described by the facility as unknown in the SWMU response letter.(7)

Date of Startup: Startup?

Date of Closure: Wastes in the waste pile were removed and disposed off-site in 1984.(7)

Wastes Managed: The waste pile received "non-hazardous" catalysts of unspecified composition.(7) Composition or desc. of catalysts?

Release Controls: Any?

History of Releases: Appearance?

4..2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4..3 Further Action Required

lack of
blue pellets
+ green catalysts
on 10/10/84
Could not
find
Klaus
H. St.

4.35 Waste Pile C

4..1 Information Summary

Unit Description: Waste Pile C is located north of the north ocean pond near the west fence line. It has dimensions of 600 ft by 90 ft.

Date of Startup:

Date of Closure:

Wastes Managed: The area has been used to dry dewatered lime blowdown and spent clay from the flare lime basin and clay dewatering basin. The waste pile also received fluid catalytic cracker catalyst and unspecified "non-hazardous" pond sludges prior to 1982.

Release Controls:

History of Releases:

4..2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4..4 FURTHER ACTION REQUIRED

Pile of lime type material
Description? on bare ground
on bare ground?

Dates of service? not known

Composition of catalyst??
Which pond sludges?

What does area look like? pile 5-6 ft

Where does runoff go? in undrained area

does not appear to release anything

Some piles of material

a couple of piles of wet material
have some oil
little pink balls
catalyst in it
N. odor

4.38 Foul/Sour Water Tanks 303 and 304

4.38.1 INFORMATION SUMMARY

Unit description: Tanks 303 and 304 are located north of the API separator, each is constructed of steel and is 38 ft in diameter by 42 ft high and has a capacity of 335,000 gallons.(7)

Date of startup: *Startup?*

Date of closure: These are active units.(7)

Wastes managed: The tanks receive refinery foul water streams prior to treatment at the foul water oxidizer. They serve as pretreatment units for solids removal, emulsion settling, oil skimming and to dilute streams with high concentrations of contaminants.(7) Constituents of wastewater treated in the tanks include sulfides and ammonia.(7)

Release controls: *Containment?*

History of Releases: *Appearance?*

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

4.39 Foul Water Oxidizer

4...1 INFORMATION SUMMARY

Unit description: The foul water oxidizer is a steel vessel located on the south side of the boiler plant. It is six ft in diameter and 45 ft high.(7)

Date of startup:

Startup?

Date of closure: This is an active unit.(7)

Wastes managed: The oxidizer receives foul water from Tanks 303 and 304 (Unit 4.38). The water is heated and exposed to air to oxidize potentially reactive compounds to non-reactive species prior to the waste stream being discharged to the wastewater treatment system.(7)

How is it oxidized?

Release controls:

Containment?

Signs of leakage?

History of Releases:

~~4...2 RESULTS OF VISUAL SITE INSPECTION~~

4...3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4...4 FURTHER ACTION REQUIRED

on concrete and
injected NaOH
have no...

ammonia
now to 4

Steam / No
no signs of
leakage

not detected

would go to
CO boiler
now vented
to atmosphere

FCC

4.40 WEAK ACID NEUTRALIZATION SUMP

4..1 INFORMATION SUMMARY

Unit description: The weak acid neutralization sump is located west of the strong acid neutralization sump. It is five feet in diameter and eight feet deep. The sump is constructed of concrete with an acid-resistant brick liner.(7)

Date of startup: ?

Date of closure: This is an active unit.(7)

Wastes managed: This unit receives weak sulfuric acid from the Acid Plant. Here it is mixed with caustic to neutralize it to a pH of between 2 and 12.5. The neutralized effluent is discharged to the neutralization pond for secondary neutralization.(7)

Release controls:

History of Releases:

~~4..2 RESULTS OF VISUAL SITE INSPECTION~~

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

only can do
pump station
blind or where does it go?
Fund on map
blended
had lead
maybe
Tiber
had into acid
closed sump
top w/ 2 pump
some water level
from pipe on top
goes to
neutralizing
pump.

4.41 STRONG ACID NEUTRALIZATION SUMP

4..1 INFORMATION SUMMARY

Unit description: The strong acid neutralization sump is located east of the weak acid neutralization plant. It is five feet in diameter and eight feet deep.(7)

Date of startup:

Construction?

? 2/1/15

Where does sump lead to?

neutralizing
pit too.

Date of closure: This is an active unit.(7)

Wastes managed: The sump receives acid spills

Wastes?

Release controls:

Lined Brick?
Clean out sump?

History of Releases:

~~4..2 RESULTS OF VISUAL SITE INSPECTION~~

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

has been added in
past yr but no
only used for leaks
in acid pit

do not know
is that

do not previous
to this - replaced
about

4.42 Alkylation Plant Neutralization Sump

4..1 INFORMATION SUMMARY

Unit description: The sump is located on the west end of the alkylation and isomerization plant. It measures 7 ft wide by 15 ft long by 7 ft deep. It is constructed of concrete and has an acid-resistant brick liner.(7)

Date of startup:

Startup? plant A

brick lined
Blind sump? Flow
✓ acid sump

Date of closure: This is an active unit.(7)

Wastes managed: The sump receives acid spills and washdown water from the alkylation plant. Here they are mixed with caustic and neutralized to a pH between of 2 and 12.5. Sump effluent is discharged to the waste water treatment system through the storm sewer system.(7)

How discharged?

gravity
fill
drain

Release controls: The concrete sump is lined with acid-resistant brick.(7)

cleanout?

History of Releases:

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

4.43 STORM WATER CULVERT

4..1 INFORMATION SUMMARY

Location?
construction?

Unit description: Storm water from the area west of the storm b⁶y, including the acid/amine plant, flows through a culvert to the ocean.(8)

Date of startup:

Dates of service? will be closed
swale that runs
adjacent to slump
drains

Date of closure:

Wastes managed:

Sampling of storm water? ?

Release controls:

History of Releases:

Appearance? not good.

~~4..2 RESULTS OF VISUAL SITE INSPECTION~~

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

4.44 CLAY DEWATERING BASIN

4..1 INFORMATION SUMMARY

Unit description: The clay dewatering basin is located west of the crude distillation unit and east of the clay dewatering impoundment. The basin is constructed of reinforced concrete and drains to the oily sewer system. It is 29 ft wide by 40 ft long by 3.75 ft high.(7)

Date of startup: Startup?

gravity flow? yes
gravel to filter out
New / Swamp at N end of basin

Date of closure: This is an active unit.(7)

Wastes managed: The basin receives spent clay from refinery clay treaters for dewatering.

what happens to clay?

Release controls: Dikes?

concrete walls angled up to S side

History of Releases:

Appearance?

signs of release?

Condition of unit?

~~4..2 RESULTS OF VISUAL SITE INSPECTION~~

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

Where does dewatered clay go? I will check

4.45 Oil Recovery Box

4...1 INFORMATION SUMMARY

Unit description: The oil recovery box is located north of Tank 304. It is constructed of reinforced concrete and is 10 ft wide by 42 ft long by 5 ft high.(7) *Above ground?*

Date of startup: *Startup?*

Date of closure: This is an active unit.(7)

Wastes managed: Wastes placed in this unit include recovered oil from spills or cleanup of process systems. The box serves as a settling unit for solids in the oily wastes. Solids are periodically removed and placed in the land treatment unit.(7) *How often does it receive wastes on avg?*

Release controls: *Containment?*

History of Releases: *Condition?*

~~4...2 RESULTS OF VISUAL SITE INSPECTION~~

4...3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4...4 FURTHER ACTION REQUIRED

11/12/86

Chevron Hawaii

Tom Schaefer . lead design Eng'g, Env. Coor.

Jim Jenkins . ops supervisor

① No loaded sludges to waste treatment. \rightarrow offsite to United

② Process tankage - test for lead, \Rightarrow land treatment or
Waste oil box for recover

③ Waste oil box - pit takes sludges - pump to open tank
to recover

Rain H_2O - berms ; drains to central

Tank farm - storm water, and
(segregated) ① ② oily H_2O

↓
API

↓

Waste H_2O treatment

Waste H₂O Treatment Sys

Flare oily basin: out of service late '84

has had unit replaced on non-cathodic basis since. Waiting on EPA approval on closure plan

Oil Sewer sys.

① API sep. oil skimmer and recovery tank → crude reprocess

H₂O from API to south surge pond to #1 oxid. pond (Aerators)

Ox Pond skimming goes directly to oil recovery ponds, as well as oil from surge ponds. Solids from surge ponds go to land farm

Storm Sewer:

- ① Storm bay
- ② North ~~surge~~ surge pond
- ③ Ox Ponds

In heavy rains can divert to North and South ocean ponds. Also divert if pH not in correct range

① Ox Pond \Rightarrow ② Ox pond \Rightarrow ③ Ox pond

to impounding basin

\Rightarrow IFF (TSS removal)

\Rightarrow Outfall sump

\Rightarrow Ocean diffuser

Also Brine system goes direct. to outfall sump. Brine used as $\xrightarrow{\text{pH } 4.2}$

neut. ~~Acid~~ pond receives pH > 2 , Neut'd with lime (< 12.5)

\Rightarrow Settling Pond/Basin. Solids out, Neut H_2O to impoundment basin

Solids to Flare line pit for drying & off-site disposal

Flare is only in name.

lab wastes go to oily sewer
truck washing - none according to facility

No drum cleaning

IAF: outfall sump flow algae to landtreatment facility. No oil.

Drum storage - empty drum storage prior to disposal

Waste - Unitek stores all HW. No accumulation at Chevron. Unitek brings barrels, Chevron fills 'em and Unitek stores 'em till they can ship 'em to Class I.

Unitek in use since reg's for leaded tank sludge.

Leaded sludge disposal prior to unitek.

TEL weathering area. ~~Leave~~ Leave it to weather - this was past practice. They claim to have scraped it clean and sampled to assure goodness. Late 70's

Storm sewers do not cover from area south of Acid plant, and from LPG area. LPG is low, and water just stands until it dries. Acid plant currently just drains to ocean. They plan to change that

~~Ox ponds~~ North ocean pond

c. 1000 ft long, 50-100 ft wide

6-8 ft. total depth - 2-4 feet at inspec.

black coating around dikes - oily stains

overflow drain connects to south ocean pond,

3-4 ft. above water level at inspec.

black coating (oily stains) extend 3 ft. above water level at inspec. Lots of oil spots appear on H_2O surface. Oily scum much more pronounced on western side of pond due to wind.

South Ocean Pond

250-300 ft long, 50-100 ft wide

lower H_2O level at inspec. some dark coating on west, windward side, though not as heavy and goes perhaps 1 ft higher on dikes.

Dark lines indicate freeboard of < 2 ft at some time. Pond has flood gate receiving from IAF pond.

IAF Pond

probably 2 - 10 feet deep.

100 ft by 50 ft. lots of scum floating on western, windward side. Foreboard < 1 foot at inspec.

Overflow gate to South ocean pond about 2-3 inches above current pond level.

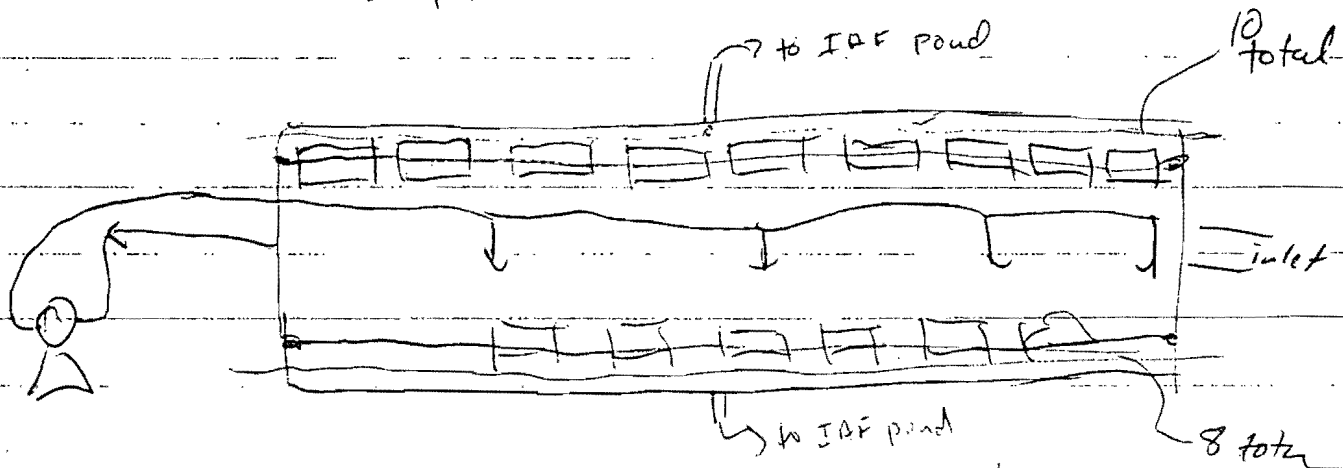
IAF pond directly south of south ocean pond, share same dike. South ocean pond level at least 6 feet below IAF pond.

Lots of moist, green crud on ocean pond side of dike indicating potential seepage.

IAF Unit

rotating skimming fin device decants floating surface scum to IAF pond. On both sides of unit

50 feet long, 15 feet ^{wide} ~~long~~, 10 feet deep inlet 8" pipe at east end of unit



entire unit is above IAF pond to take advantage of gravity feed

Outfall Sump

Pond about 50 x 40 ft. Depth uncertain, maybe below grade.

Freeboard = 8 inches, if that

Impounding Basin

200 ft x 70 ft. depth unknown.

8" to 1 ft freeboard, if that. below grade

receives waters from Ox ponds, and sends

to IAF unit; Flocculant is metered in
cationic flocculant

there is sludge on the bottom. hasn't been cleaned yet.

Waste oil Box (sump)

oil is reused 10 x 15 depth unknown
level 4-5 feet below ground at inspec.
grunge line approx 3 feet below surface
pumps to API separator

smaller tank covered on side, 12 x 3 much
darker indicating higher oil content

Oil recovery Box

30 x 8 inches mat'l. like tars and
other semi solid HC's. Unit uses steam to liquify.

API Separator

100 x 25, covered.

Crud on outside indicate overflow or seepage
water flows over weir at one end.
phase.

Several cracks show seepage
Valves leak, lots of crud on valve and dripped
onto ground.

South Surge pond

70 x 30 depth unk.

really cruddy, something grandma probably wouldn't appreciate

Skimming device is pretty crude, a rake device with a long handle.
Freeboard < 2 ft.

North Surge pond

Same size as above, Water phase
Freeboard less than 2 ft.

Oil on surface at west, windward end

Ox Ponds

Big, smelly, slimy, and foamy.

looks like a liner is in place in eastern most pond
lots of oily crud on dikes. Freeboard about 1-1.5 ft.

Neat Pond

Same size as surge ponds. 2 of them,
the south one has higher level than the north,
they are connected by a weir, at inspec, 1-1.5 ft.
freeboard on south pond, 2 feet on north pond
evidence of fill on dikes from repair. No
mixers, Lime and acid flow through pipes over
north pond into south pond, then south pond over flows
to north pond. Gate to ~~ox~~ pond was closed

When was it
used last for API
sep sludge

Under what circumstances
is it used now.

API sep sludge
went in 6 mos.
ago

Flare Basin

150x40 level 6 feet below dike top
at inspec. oily, gunky, Hch 'n' thick
grunge level indicates previous level w/ 1 ft.
of freeboard.

near Sewakaucha
Chert freeboard by nearby
five ponds area if
overflowing

lime sludge pond

70x40 thick sludge from acidulent pond
level about 3 ft. below dike top.

Landfarm

2 x (200 x 70)

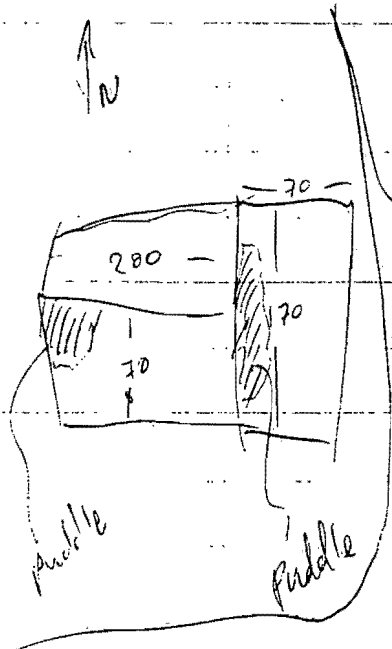
4 ft. below dike top.

Southern fill has large puddle on north western
corner. Water is chocolate red.

1 x (170 x 70), 4 ft below dike top
puddle

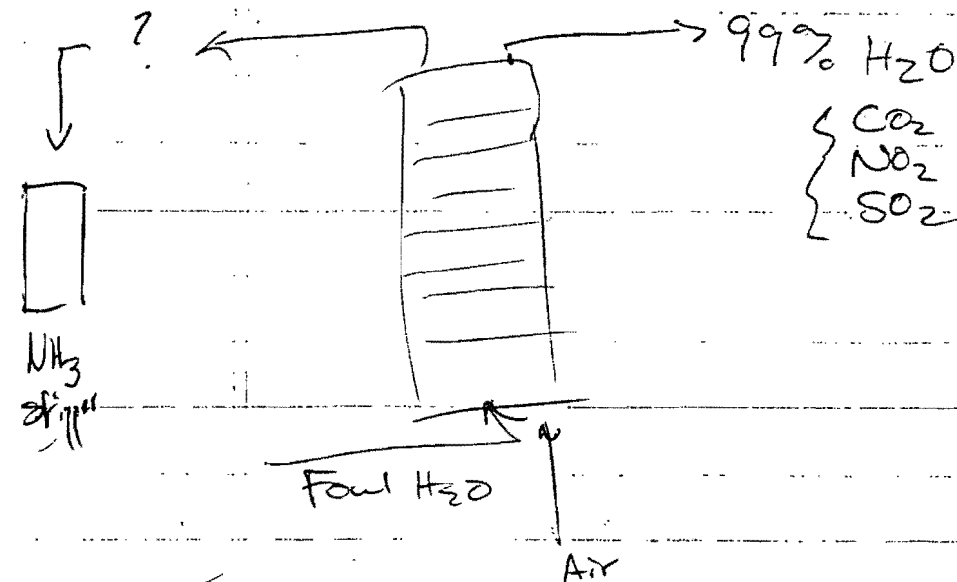
Clay dewatering impdmt - angular trough 15 ft
wide, 3 ft deep at deep end

basin at end of impdmt
3 ft deep, drains to oily sewer



11/13/86

Foul H₂O or



IAF - Air comes in with recycle line. F of incoming H₂O induces air

A pond liner - installed after ponds built to resist wave action erosion of berms. liner on berm walls only

70's Oily sludge pit/pond - same time in as lime sludge pit. uncertain about freq. but probably was used a lot at installation. Currently "not used". Inadvertently used 6 was ago.

Disposed - H632 black H631 white cat.

Passed EP Tox

Blue
BIN

Co Mo Ni on alumina
Ni or Si



Landfill A.

Area 200 x 200 - extent of landfill vacated
puddled water, vegetation

Wastepile C

100 ft long x 4-7 feet high
a couple of truckloads of grey sludge which
has little pink spheres \Rightarrow (catalyst?)

maybe diatomaceous clay
from jet fuel A filter
unit

Waste Drum storage area

Red oil floating on ~~at~~ water puddles, red stained
soil Also 6x6 area of oil drenched earth
with one drum of oil, nearly empty, and ~~two~~ ^{near} ~~three~~ drums
of fine white powder

- 4.11 IAF Unit - late 1970's / early 1980's / Nalco Flocculants
- 4.12 IAF Pond (RCRA regulated) cleaned quarterly
- 4.13 Temporary Surface Impoundments -
- ~~4.14~~ Exchanger Cleaning Facility (discuss / not SWMU)
- 4.15 Waste Pile Area (area x?)
- 4.16 Old Surface Impoundment area
- 4.17 Cleaning and Disposal Impoundments
- 4.18 Drum Storage area (same as 4.0?)
- ~~4.19~~ Sulfuric acid/amine plant ponds - No ponds, old impoundment area
final washwater from MEA Wash
- 4.20 Flare Oily Basin
- 4.21 Flare lime basin
- 4.22 Surface impoundment unit 3
- ~~4.23~~ Surface impoundment unit 5 - same as #19
- 4.24 Carbon monoxide incinerator eliminate as SWMU
- ~~4.25~~ Electrostatic precipitator--Fluid Catalytic Cracker eliminate as SWMU
- 4.26 Landfill A
- 4.27 Landfill B - could not locate (in trees)
- 4.28 Clay Dewatering Impoundment - ?
- 4.29 Sewer Sludge Impoundment
- 4.30 Amine Washwater Impoundment same as #23, 4.19
- ~~4.31~~ Crude Tank Area Impounding Basin } property
sold to Heco
- ~~4.32~~ Tankfield Storm Water Sump
- 4.33 LPG Area cooling Water Pond
- 4.34 South Ocean Pond } built in 1970's, normally do not sample (might if had upset)
(to protect bugs)
- 4.35 North Ocean Pond
- 4.36 Waste Pile A - landfarm
- 4.37 Waste Pile B - in trees
- 4.38 Waste Pile C
- ~~4.39~~ FCC Catalyst Fines Hoppers V-5312 and V-5313 - eliminate as SWMU
- 4.40 Empty Drum Storage Area (same as 4.18)
- 4.41 Foul/Sour Water Tanks 303 and 304
- 4.42 Foul Water Oxidizer
- 4.43 Weak Acid Neutralization Sump } to neutral. pit
- 4.44 Strong Acid Neutralization Sump
- 4.45 Alkylation Plant Neutralization Sump to oily water sewer
- 4.46 Storm Water Culvert

✓4.47 ✓ Clay Dewatering Basin

✓4.48 ✓ Oil Recovery Box

4.49 Oily Sewer System--see reference 7, empty drum storage

4.50 ^{acid} Storm Sewer(8)

✓4.51 Storm Bay(8)

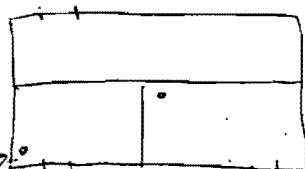
4.52 Other Areas of concern:

4.52.1 liquified ^{petroleum} gas area(8)

Storm water culvert

#1 on plot plan

lysimeter



automatic sprinkler system

4.1 LAND TREATMENT UNIT

4.1.1 Information Summary

Unit Description: The land treatment unit is 3.1 acres in size, and consists of three bermed cells. (6-confidential, 9) The unit was constructed by leveling and compacting the coral base, installing dikes made of compacted coral and importing clean fill for treatment zone soil. (8) Berms above grade,

use bulldozer to spread wastes. Bulldozer must exit and drive around land farm to ~~not~~ go from cell to cell. The eastern cell does have washdown facilities. Date of Startup: The unit was constructed in 1980. (3, 12) The 2 western cells do not

Date of Closure: This is an active unit. (12)

Wastes Managed: Wastes managed in the land application area include ~~(API separator sludge)~~ non-leaded tank bottom sludges, DAF float, jet fuel filter media, oily soil, heat exchanger bundle cleaning sludge and non-RCRA regulated materials. (1, 3, 6-confidential) do not put RCRA reg. sludges ~~(API sep)~~ (2 or 3) (ie Pb sludges)

Release Controls: Lysimeters and groundwater monitoring wells have been installed near the treatment unit. (3, 9) The unit is inspected weekly. (12)

History of Releases:

4.1.2 Conclusions

Groundwater Release Potential: Groundwater releases from this unit are regulated under RCRA.

Surface water release potential:

Air release potential:

~~Order~~ - min. -

Subsurface gas release potential:

H₂S, methane?

4.1.3 Further action required

tractor leaves land farm;
to enter 3 separate areas -
washdown on E end, none on west
can track.

Chevron hopes to remove
dividers + operate facility
as 1 unit - awaiting EPA
approval

ok.
-yes

clay filters - currently haul - to municipal landfill

#10 on plot plan

4.2 INACTIVE LAND TREATMENT AREA (Also known as Site X)

4.2.1 INFORMATION SUMMARY

Unit description: An area measuring approximately 50 feet by 70 feet was used to treat leaded tank bottoms. The area was located directly south of Tank <7730?>. The unit consists of an open area of compacted coral.(5) currently OOS
250

Date of Startup: Unknown.

Date of Closure: The area was taken out of service in 1980, when the upper layers of material and some underlying coral were removed. Samples of the remaining strata passed an EP Toxicity test, according to the facility.(5)

Wastes Managed: Leaded tank bottoms were "weathered" in this area.(5)

Release Controls:

in tankage area
w/in diked tank area.

History of Releases:

currently flat, large pools
of rainwater

4.2.2 Conclusions

Groundwater release potential:

Weathered Pb^{tank} sludges on
ground -

Surface water release potential:

removed ground to ~6" below
grade, sampled ground

Air release potential:

for Pb (total) + moved
to land farm ~1980

Subsurface gas release potential:

(around 5/6 of landfarm -
one of 1st mat'l's in)

4.2.2 FURTHER ACTION REQUIRED

Add'l info needed

#28 on plot plan

U of API - rec.p. pump - next to 3
lube oil barrels - w/ Chevron Logo
pump, pump pad, oily / lube oil drips
service? Tom to check

4.3 API SEPARATOR

4.3.1 INFORMATION SUMMARY

Unit Description: The API separator is 22 ft wide by 70 ft long by 6 ft high and is divided into two cells.(7) Oil from the separator is discharged to the recovered oil system and water is routed to the wastewater treatment system.(7) Concrete roof/platform.

Date of Startup: Unknown.

motor driver for paddle - oil spill on ground - looks like lube
oil from motor
H/C smell - volitile - open end (S) overflow weir
end covered w/ H/C,

Date of Closure: This is an active unit.(7,9)

Wastes Managed: The separator receives process wastewaters and other oily water from refinery operations which have been routed through the oily sewer system.(8) Results of analyses on the API sludge are shown in Table __.(9)
The sludge is a defined hazardous waste, Waste No. K051.

Release Controls: The separator is inspected weekly for evidence of leakage or cracking of the structure.(12)

History of Releases:

4.3.2 Conclusions

Groundwater Release Potential:

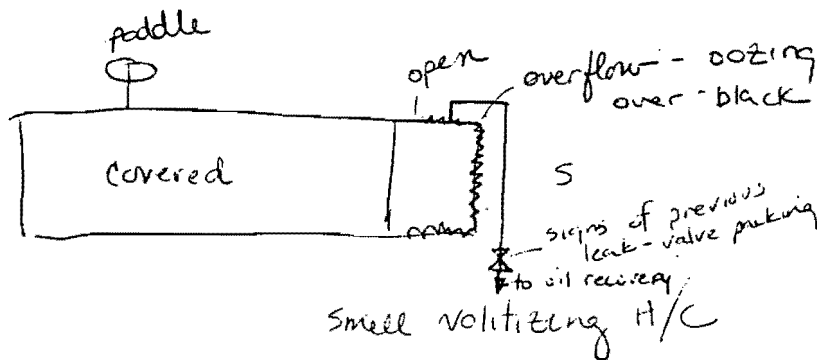
Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.3.3 Further action required

API - no scheduled T/A
only S/D when have problem w/ unit



#17 on plot

4.4 NORTH SURGE POND

4.4.1 INFORMATION SUMMARY

cleaner than South.
waters brown -
oil seen on western 50%

Unit Description: The north surge pond is located south of the neutralization pond. It has a capacity of 160,000 gallons, and measures 110 ft by 40 ft.(7)
It is not lined.(8) It is not RCRA regulated.(12)

oil stains on walls.

Date of Startup: Unknown.

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond receives storm water runoff prior to its treatment in the oxidation ponds.(7)

Release Controls: It is not known whether release controls exist for this unit.

History of Releases:

4.4.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.4.3 Further action required

manually skim oil + send
to recovered oil tank

#2 on plot

4.5 SOUTH SURGE POND

4.5.1 Information Summary

Unit Description: The south surge pond is an unlined 0.16 acre surface impoundment which is used as an equalization basin.(8)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(8)

Wastes Managed: The pond receives effluent from the API separator.(8,12)

Results of metals analyses on pond sludge are shown in Table __.(9)

Benzene, Toluene, naphthalene, fluorine

Release Controls: The pond is inspected daily to ensure that two feet of freeboard are maintained at all times.(12)

History of Releases:

4.5.2 Conclusions

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4.5.3 Further action required

- Thick H/C layer - 100% coverage

- H/C stains up sides

- water level - about 8" below top

- outlet to Ox pond

- heavy H/C odor (HDS area) - but windy
difficult to segregate odors.

- floating boom in front of outlet

- everything caked w/ heavy H/C

- Efficiency of API?

- skin on top

- manually skim oil + send to
recovered oil tank

#3/4 on plot plan

4.6 OXIDATION PONDS

4.6.1 Information Summary

Unit description: There are two mechanically aerated oxidation ponds on the Chevron Hawaiian Refinery site.(8) They are lined only with compacted coral (6-confidential) Oxidation Pond 1 is 0.7 acre in size and contains three barge-mounted floating aerators. Oxidation Pond 2/3 covers 1.26 acres and consists of two ponds separated by a curtain wall, with each section being served by one floating mechanical aerator.(8,12) These ponds are RCRA regulated.(12)

Date of Startup: Unknown.

Date of Closure: The ponds are active units.(9)

Wastes Managed: Effluent from the north and south surge ponds discharges into the oxidation ponds. The effluent contain phenols, oil sulfides and ammonia.(8) The results of pond sludge analyses are shown in Table __.(9)

Although Chevron has disputed this, EPA considers the pond sludges to be a listed hazardous waste due to similarity with API separator sludges.(12)

Naphthalene, ethylene, fluorine, toluene, dichlorobenzene,

Release Controls: The ponds are inspected daily to verify that that there is a minimum 2 feet of freeboard.(9,12) The overflow weir and sluice valve are inspected weekly.

History of Releases:

4.6.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

- stripped volatiles not removed in API

- minimal froth

- fabric edging around water level - protect against wave action on berms
- walls oil stained - heavy

draws suction from Nor S surge ponds

lub oil?

SE corner #3 ox -

overflow to? partitioned corner

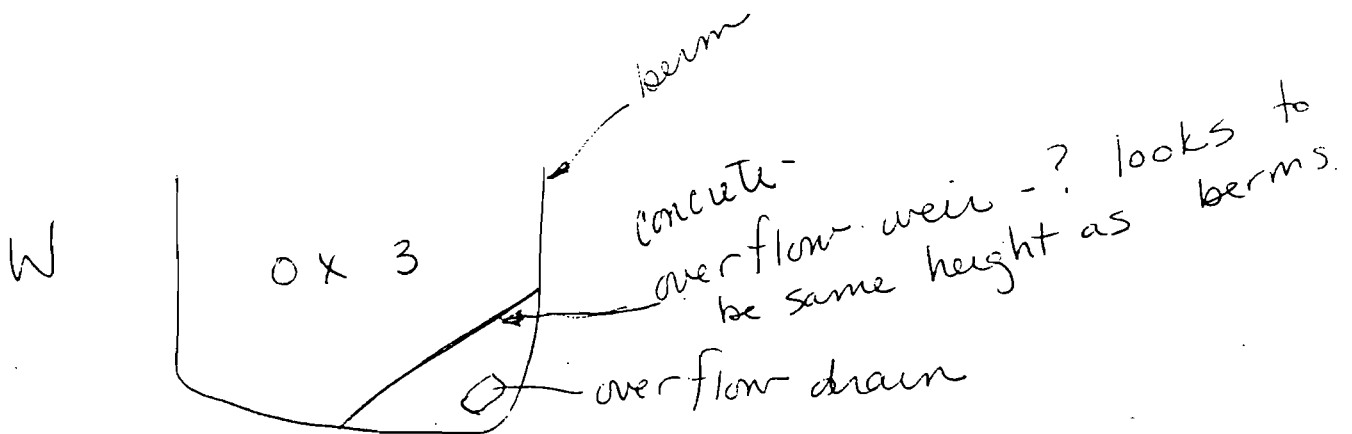
recip pump between ox ponds - S end - discharge to? oil covered pump + pad, inlet/outlet lines - curbs around 2 sides, elevated. no sign of oil seepage down (ie no stains on ground)

walls clean compared to rest of ox pond

Air Release Potential:

Subsurface Gas Release Potential:

4.6.3 Further Action Required



#15 on plot

4.8 Neutralization Basin

4.8.1 Information Summary

Unit Description: The neutralization basin is located between the settling basin and the north surge pond. It measures 110 ft by 40 ft and has a capacity of 160,000 gallons.(7)

bottom - cement lined

Date of Startup: Unknown.

Date of Closure: The basin is an active unit.(7)

Freshwater treating - lime softener - solids/ww to Neut Basin

Wastes Managed: The basin receives potentially corrosive waste streams from refinery operating units which have been neutralized in the neutralization tank to a pH between 2 and 12.5 prior to discharge to the basin. Low pH waste streams are mixed with lime slurry in the basin for secondary neutralization to a pH between 6.0 and 8.0.(7)

Release Controls:

Beautiful colors -

pink

maroon

white scum

History of Releases:

acid leaching on walls?
(white crust)

4.8.2 Conclusions

Groundwater Release Potential:

unlined.

Surface Water Release Potential:

S of N/S surge ponds.

Air Release Potential:

inlet - white, milky substance (
fumes coming off pond.

Subsurface Gas Release Potential:

4.8.3 Further Action Required

#16 on plot

4.9 Settling Basin

4.9.1 Information Summary

Unit Description: The settling basin is located north of the neutralization pond, and measures 110 ft by 40 ft with a capacity of 160,000 gallons.(7)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7)

Wastes Managed: The settling basin receives neutralized effluent from the neutralization pond. Its purpose is to provide additional residence time for lime solids to settle out.(7)

Release Controls:

History of Releases:

4.9.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.9.3 Further Action Required

same colors

white - pink - maroon

Walls ok - some white crust
no lining

no H/C odor

Sludge dredged → Flare lime
basin

#5 on plot

4.10 IMPOUNDING BASIN

notes on back of 4.2

4.10.1 Information Summary

Unit Description: The impounding basin is a 2.3 acre impoundment used as a settling basin. Effluent from the basin flows to an induced air flotation (IAF) unit for algae removal.(8) This is a RCRA regulated unit, although Chevron disputes that sludge in the basin is a hazardous waste.(12)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(8)

Wastes Managed: The impounding basin receives effluent from Oxidation Pond 2/3, settling basin effluent and cooling tower blowdown.(8,12) Results of basin sludge analyses are shown in Table __.(9) The basin serves two functions: allowing additional settling of suspended solids, and providing surge capacity for the wastewater treatment system.(12)

Release Controls: The impounding basin is inspected regularly to ensure that it is in good operating condition and that two feet of freeboard are maintained.(9,12)

History of Releases:

4.10.2 Conclusions

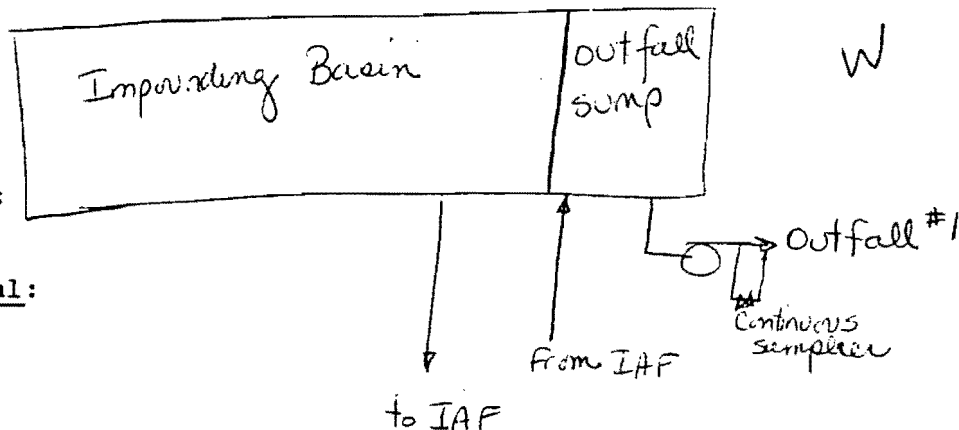
Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.10.3 Further Action Required



#29 on plot

4.11 IAF UNIT

4.11.1 Information Summary

Unit Description: The IAF, or induced air flotation unit, removes algae from influent flows from the impounding basin.(8) According to Chevron, the IAF unit is exempt from RCRA regulation since it meets the definition of a tank and it is part of an Effluent Water Treatment System regulated under Section 402 of the Clean Water Act.(12)

(Condition of unit)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(8)

Wastes Managed: The IAF unit receives effluent from Oxidation Pond 2/3, settling basin effluent, and cooling water from the cooling tower which have undergone settling in the impounding basin.(8,9)

Release Controls: The unit is inspected regularly to ensure proper operational condition.(12)

History of Releases:

4.11.2 Conclusions

Groundwater Release Potential: no hazardous components in wastes managed + no signs of leaks. GW release pot. low

Surface Water Release Potential:

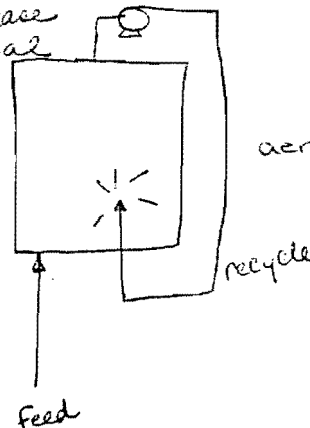
Air Release Potential:

Subsurface Gas Release Potential:

Due to nature of this unit and the wastes managed, no subsurface gas release potential

4.11.3 Further Action Required

- add'l needs
- sampling up - facility should conduct



40 x 10'
7.8' deep concrete pad

paddles green slimy mat'l
no H/C odor or sheen
skins of dead bugs from ox ponds.

v. close to ocean
stagnant water W/S of
IAF unit + pond - after
v. heavy rain

Monitoring well #19
S of IAF unit
open - no H₂S odor.

#6 on plot plan

4.12 IAF POND

4.12.1 Information Summary

Unit Description: The IAF, or induced air flotation pond is located at the far southwest corner of the refinery. It is 11 ft wide by 52 ft long and 6 ft high.(7) The pond is not lined.(9)

Date of Startup:

Date of Closure: This is an active unit.(7) III - 1-D p15 - questionable dike integrity, \therefore Chevron to replace pond w/ steel tank

Wastes Managed: The IAF pond receives float from the IAF unit and partially dewateres it. Results of analyses on the IAF float are shown in Table __.(9) Decanted effluent is directed back into the impounding basin.(8)

Release Controls: Pond levels are checked daily to ensure that two feet of freeboard are maintained at all times.(12)

History of Releases:

west end - downwind - float conc.

brown - dead bio.

green - froth

4.12.2 Conclusions

Water level - high

Groundwater Release Potential:

walls same height as ^S Ocean Pond

Surface Water Release Potential:

smell - strong - biological

Air Release Potential:

Cleaned 4x year

Subsurface Gas Release Potential:

W. wall ~ some erosion

4.12.3 Further Action Required

Remove Sludge - use back hoe
(difficult on wall?) + dump truck
coated w/ liner

#8 on plot

near ^{GW} recovery well
W of FCCU

4.13 TEMPORARY SURFACE IMPOUNDMENTS

4.13.1 Information Summary

Unit Description: Two temporary surface impoundments were operated at the site. They measured 45 feet by 80 feet, and 60 feet by 100 feet.(5)

Date of Startup: Unknown.

currently level

Date of Closure: The two impoundments were removed in 1982.(5)

Wastes Managed: Jet fuel impregnated filter clays were managed in these two areas.(5)

Release Controls:

History of Releases:

4.13.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.13.3 Further Action Required

East of tank 252 - across road across from area X
black stain - gravelly - spherical pellets
about 10' x 100'
green substance below rocks

4.14 EXCHANGER CLEANING FACILITY

4.14.1 Information Summary

Unit Description:

Date of Startup:

Date of Closure:

Wastes Managed: Waterside cleaning for removal of silica.(6-confidential) / oil side?
H/C sludges - APS preheat exchangers.

Release Controls:

History of Releases:

4.14.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.14.3 Further Action Required

hydroblast
water jets -
done @ unit during T/A -
no dedicated exchanger cleaning
area
Scale
acid sludge
when foiled
drain to oily water sewer

Notes for unit 44
west of crude unit
35 on map

4.17 CLEANING AND DISPOSAL IMPOUNDMENTS

4.17.1 Information Summary

Unit Description: The two impoundments have coral bottoms and are bermed. (6-confidential)

Date of Startup:

M
#9 - acid plant/wash water | never have cleaned out acid plant tanks.
#8 - fullers earth

Date of Closure:

Wastes Managed: The impoundments are used for cleaning of plant acid tanks and for disposal of ~~filter~~ fullers earth, and ~~jet~~ fuel from process filters. (6-confidential)

(diatomaceous earth)
dumped every 6-12 mo

Release Controls:

History of Releases:

4.17.2 Conclusions

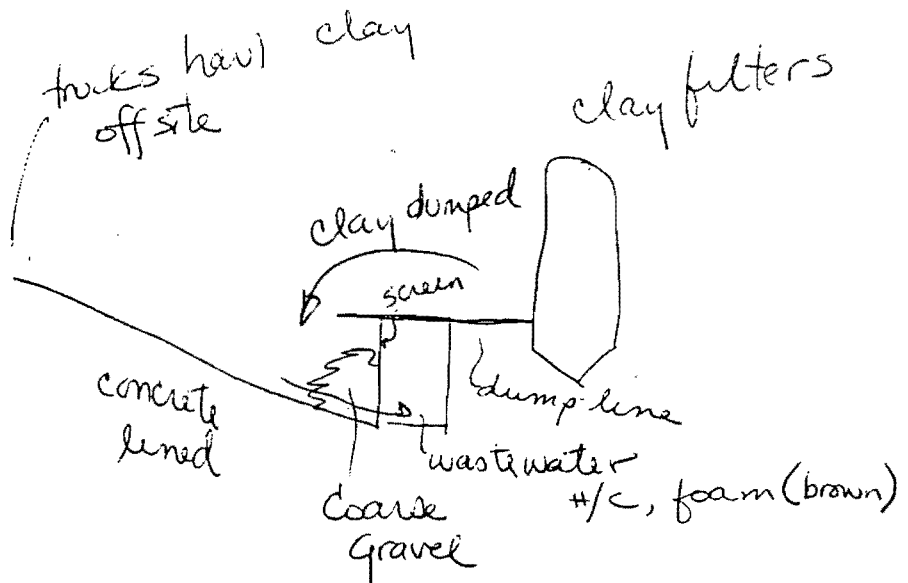
Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.17.3 Further Action Required



oily sewer to oil recovery
via API sep.

clay filters remove
impurities, residual oils
color, specs
final purification

4.18 DRUM STORAGE AREA

4.18.1 Information Summary

Unit Description: The drum storage area is located east of the north ocean pond. Its dimensions and capacity are unknown.(7) A 1986 RCRA TSD Investigation noted chemical stains on the ground next to rows of drums in the storage area.(11)

Date of Startup: Unknown.

Date of Closure: This is an active unit.(7)

Wastes Managed: Wastes in this area include empty lubricating oil and chemical drums which are being accumulated until they are shipped off-site for recycling. Any drums which have held acutely hazardous chemicals as defined by 45 FR 33122 are triple rinsed at the operating units prior to being placed in this storage area. Triple rinsing of these drums was instituted in 1984.

Do not handle hazardous material, ∴ no longer triple rinse

Release Controls:

rinse w/ product / feed stream,
discharge to unit.

History of Releases:

2 piles - rusting pipe fittings

4.18.2 Conclusions

Groundwater Release Potential:

+ Groundwater oil recovery - SE end, W of crude unit

open area, temporary oil recovery pump

Surface Water Release Potential:

leak from sto tanks - new project to

add membrane lining (double line)

Air Release Potential:

all tanks. project to put in more wells

Subsurface Gas Release Potential:

+ Drum sto - about 1000 drums

horiz - about 4 high, water puddle

red-burgundy spots (1/4" - 1" diameter)

Some on platforms, most on ground

One area - south of rest, open, vertical drums (heavy service, stained black) rainwater/H/C inside - no sign of leak

Some standing water - algae growing

Spill - west end 2d' x 4'

4 drums, wood platform < 2 black stain

4.18.4 Further Action Required

Bone yard - next to expand aerator, black sand pile - covers ~ 20' x 30' thin layer Abrasive - sand blasting - (from bags) by KLEEN & AST

rainwater, open

#7 (or close)

4.20 FLARE OILY BASIN

named due to proximity to flare

4.20.1 Information Summary

Unit Description: The flare oily basin has 0.24 acres in surface area.(9) covered? no
vented? no
lined? no

Date of Startup: Unknown.

Date of Closure: According to a December, 1985 inspection, this unit is no longer in use and will undergo closure.(10)
last used 6-8 mo. ago

Wastes Managed: This basin receives oily skimmings from the oxidation ponds and other oily wastes, such as oil spill material.(2,9) API separator sludge may also have been placed in the basin.(9) Analysis of sludge from the flare oily basin detected toluene at 2 ppm, chrysene at 20 ppm, and fluorene at 20 ppm. Appendix VIII metals were below Total Threshold Limit Concentrations (TTLC).(9) Results of analyses are shown in Table __.(9)

Release Controls: It is not known whether release controls exist for this unit.

received API sep. sludge at one time

History of Releases:

Heavy oil top - ~85%

4.20.2 Conclusions

Misc trash - cans, barrels, insul.

Groundwater Release Potential:

w/ overflow weir to

Surface Water Release Potential:

Some semi solids - Solidified H/C on walls

Air Release potential:

level low - ~10-12' below top

Subsurface Gas Release Potential:

elevated about 10'

4.20.3 Further Action Required

high water stains ~3' feet below surface

inlet line blinded - figure 8 on N side of pond

H/C odor - light / windy day
now O.O.S. used intermittent basis - example? Tom to check

(around #7 on plot)

4.21 FLARE LIME BASIN

4.21.1 Information Summary

pump out from neutral settling basin
solids - precipitate

Unit Description: The basin is located east of the API separator and south of the cooling tower, and measures 110 ft by 80 ft with a capacity of 350,000 gallons.(7) It is not a RCRA regulated unit.(2) A 1986 RCRA TSD investigation noted that the basin was leaking along the side of its dike.(11)

Date of Startup: Unknown.

10-12' of lime precipitate
solid

Date of Closure: The basin is an active unit.(7)

Wastes Managed: The basin is used to dry alkaline lime sludge that has been removed from the acid/amine/ boiler blowdown neutralization ponds.(2)

Release Controls: It is not known whether release controls exist for this unit.

History of Releases:

West of Flare only basin
surface about 4-5' below
top.

4.21.2 Conclusions

Groundwater Release Potential:

walls - look ok

Surface Water Release Potential:

Due W of flares
original - 1960?

Air Release Potential:

currently 0.0.5.

Subsurface Gas Release Potential:

inlet line blinded off - N end

4.21.3 FURTHER ACTION REQUIRED

4.24 CARBON MONOXIDE INCINERATOR - CO Boiler

4.24.1 Information Summary

Unit Description: located in boiler house

Date of Startup: Unknown.

add promoter; no longer in operation

Date of Closure: Unknown.

as CO boiler - used now as regular boiler for steam generation

Wastes Managed: The incinerator burns effluent gas from the Fluid Catalytic Cracker to complete combustion.(4) $CO \rightarrow CO_2$

Release Controls: It is unknown whether release controls exist for this unit.

History of Releases:

4.24.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.24.3 Further Action Required

no longer in operation

4.25 ELECTROSTATIC PRECIPITATOR--FLUID CATALYTIC CRACKER

4.25.1 Information Summary

Unit Description:

Date of Startup:

Date of Closure:

Wastes Managed: This unit controls dust emission from the Fluid Catalytic Cracker effluent gas. (4) remove cat. fines from Fuel gas. Fines sent to hoppers and recycled back to unit.

Release Controls:

History of Releases:

4.25.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.25.3 Further Action Required

4.26 LANDFILL A

4.26.1 Information Summary

Unit Description: Landfill A is located south of the sewer sludge impoundment. Its dimensions and capacity were stated to be unknown in the facility's SWMU response letter.(7)

Date of Startup: Unknown.

Date of Closure: The landfill was taken out of service and graded in 1984.(7)
Ground - slick mud.

Wastes Managed: Wastes placed in the landfill included Fluid Catalytic Cracker catalyst fines (regenerated), clay treater spent clay, and lime blowdown.(7) from boiler plant (fresh water treating)

Release Controls:

History of Releases:

4.26.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.26.3 Further Action Required

#11 on plot W of FCCU
size of process block
swampy - after heavy rainfall

veg - weeds + scrub
S end 2 trailers / containers
1 container - pile of boxes
trailer (contractor -)

4.27 LANDFILL B

4.27.1 Information Summary

Unit Description: Landfill B is located in the northwest section of the plant property.(7) in trees, accross from tanks 104 et al. (crude)

Date of Startup: 1978.(7) about 1 acre
lots vegetation - grasses

Date of Closure: No disposal has taken place in this area since 1982.(7)

Wastes Managed: Landfill B was used to dispose of various materials , including trees cleared from the site, asphalt and dirt from asphalt spill cleanup, and an asphalt roof which was damaged during a 1981 hurricane.(7)

Release Controls:

NE - organic mat'l, tree limbs

SW - roof tar paper

old tire (rubber)

broken concrete foundations

History of Releases:

4.27.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.27.3 Further Action Required

33
4.32 LPG AREA COOLING WATER POND

4.32.1 INFORMATION SUMMARY

Unit Description: The cooling water pond located along the fence line at the north end of the Chevron property. It has a capacity of about 1,200,000 gallons and measures 85 ft by 1,100 ft.(7)

Date of Startup: Unknown.

Date of Closure: The pond was taken out of service and regraded in 1982.(7)

Wastes Managed: Wastes in this pond included once-through brine cooling water from the LPG refrigeration compressors.(7)

Release Controls:

History of Releases:

4.32.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4.32.3 Further Action Required

below grade
gravel LPG sto area
High water outlet to Ocean
coral/rock dike around area.
water in pools high evap
#20 on plot
Across street - from
LPG sto area (W)
uneven ground.
veg. - weeds/grasses.
rainwater puddles
no staining

LPG - once thru CW (brine) - NPDES outfall #2 since 1980
prior to 1980 - used LPG percolation pond.
ref. fence, open area (10')
rock wave break - 6' high

#21 on plot

4.33 South Ocean Pond

4.33.1 Information Summary

Unit Description: The south ocean pond is located along the west fence line at the south end of the refinery. It measures 90 ft by 240 ft and has a capacity of 900,000 gallons.(7)

Date of Startup:

Date of Closure: The pond is an active unit.

Wastes Managed: The pond is used during heavy rains to temporarily hold storm water. The water is held until it can be routed back to the wastewater treatment plant during lower flows.(7)

Release Controls:

History of Releases:

4.33.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential: Due to the nature of this unit and the wastes it receives, there is no potential for subsurface gas generation.

4.33.4 Further Action Required

overflow - from N. ocean
cleaner than N. ocean pond
highwater - ~ 1 1/2' below top
... only stains much lighter than N. pond.

overflow weir from
IAF pond
leeward walls - clean

11 22 on plot

4.34 North Ocean Pond

4.34.1 Information Summary

Unit Description: The north ocean pond is located north of the south ocean pond along the west fenceline of the refinery. It measures 90 ft by 970 ft and holds 3,500,000 gallons.(7)

Date of Startup:

Date of Closure: The pond is an active unit.(7)

Wastes Managed: The pond serves the same function as the south ocean pond, holding storm water runoff during periods of high rainfall until the water can be routed back into the wastewater treatment system during periods of lower flow.(7)

Release Controls:

History of Releases:

4.34.2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential: Due to the nature of this unit and the nature of the wastes it receives, there is no potential for generation of subsurface gas.

4.34.3 Further Action Required

Acid plant drainage
causeway between N.E.S
ocean pond into ocean
will ~~be~~ block + redirect
water to ——— by EPH
deadline

walls sand, coral, indication of erosion on west wall

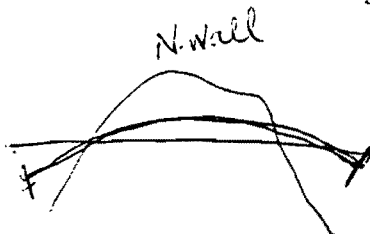
~ 6-8' above grade - w/in 25' of ocean.

from entire refinery, metered back to treatment
oil stains - high water marks
overflow drain connecting 2 ocean ponds.

oil sheen in spots
heavier threads on west end -
ocean side

North end - day 2
level dropped considerably
H/C odor
open ended line thru wall
emergency hook-up?

solid ~~bed~~ debris on walls -
wire, re-bar, paper, cardboard
truck ramp



#23 on plot

4.35 Waste Pile A

4.35.1 Information Summary

Unit Description: Waste Pile A is located west of Landfill B. The dimensions and capacity of the waste pile are described by the facility as unknown in the SWMU response letter.(7) Across from old Pb weathering area

Date of Startup:

Date of Closure: Wastes in the waste pile were removed and disposed off-site in 1984.(7)

Wastes Managed: The waste pile received "non-hazardous" catalysts of unspecified composition.(7) ||?

Release Controls:

History of Releases:

4..2 Conclusions

Groundwater Release Potential:

Surface Water Release Potential:

Air Release Potential:

Subsurface Gas Release Potential:

4..3 Further Action Required

across road from tank farm
in vegetated area - catalyst
lying on ground

- extruded blue pellets (looks
like HDS catalyst) -
Cobalt Moly per Tom

- black spheres - nickel
on silica per Tom

#25 on plot

38
4.3⁸ Waste Pile C

4..1 Information Summary

Unit Description: Waste Pile C is located north of the north ocean pond near the west fence line. It has dimensions of 600 ft by 90 ft.

Date of Startup:

water puddles
truck tracks

W/S of FCCU

Date of Closure:

sm. piles of lime

Wastes Managed: The area has been used to dry dewatered lime blowdown and spent clay from the flare lime basin and clay dewatering basin. The waste pile also received fluid catalytic cracker catalyst and unspecified "non-hazardous" pond sludges prior to 1982.

Release Controls:

piles of goo, semisolid

black, cracked grey

w/ catalyst? sm. pink balls

FCCU cat (from very fine - Tom usually white)

History of Releases:

4..2 Conclusions

Groundwater Release Potential:

piles on west -

brown/grey

Surface Water Release Potential:

Air Release Potential:

pile of reinforced concrete piles

fabric bags of?

in pile

Subsurface Gas Release Potential:

4..4 FURTHER ACTION REQUIRED

clay piles?

rust color staining around
reinf. concrete

39
4.36 FCC Catalyst Fines Hoppers V-5312 and V-5313

4..1 INFORMATION SUMMARY

Unit description: The hoppers are located at the north corner of the catalytic cracking plant. Each has a capacity of 25 tons, with dimensions of 9 ft in diameter and 28 ft high. They are constructed of steel.(7)

Date of startup:

Date of closure: The hoppers are active units.(7)

Wastes managed: The hoppers are used to store regenerated catalyst fines from the Fluid Catalytic Cracking Unit precipitator until they are taken off-site for disposal.(7)

All fines recycled to unit

Release controls:

in past used to have contractor remove hoses still intact.

History of Releases:

4..2 RESULTS OF VISUAL SITE INSPECTION

promoter catalyst added to regen
converts CO to CO₂

4..3 CONCLUSIONS

do not use CO boiler

Groundwater release potential:

flue gas from unit to
ESP to boiler house to

Surface water release potential:

Stack

Air release potential:

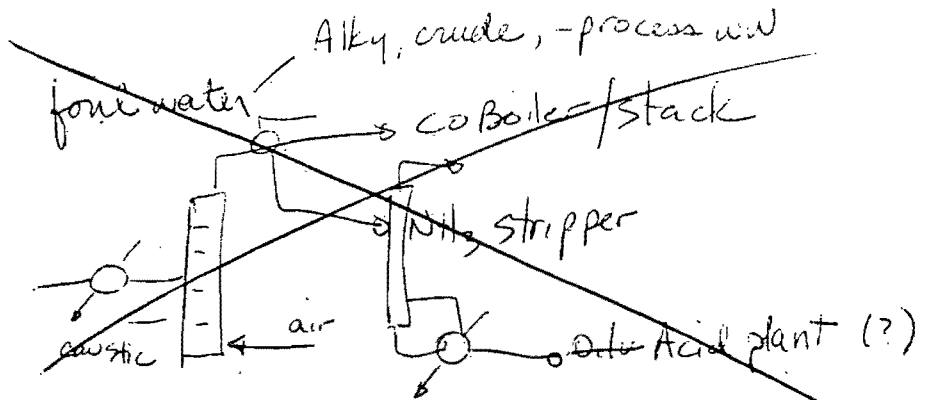
area ✓ clean.

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

42
4.39 Foul Water Oxidizer

4...1 INFORMATION SUMMARY



Unit description: The foul water oxidizer is a steel vessel located on the south side of the boiler plant. It is six ft in diameter and 45 ft high.(7)

Date of startup:

Date of closure: This is an active unit.(7)

Wastes managed: The oxidizer receives foul water from Tanks 303 and 304 (Unit 4.38). The water is heated and exposed to air to oxidize potentially reactive compounds to non-reactive species prior to the waste stream being discharged to the wastewater treatment system.(7)

Release controls:

History of Releases:

4...2 RESULTS OF VISUAL SITE INSPECTION

4...3 CONCLUSIONS

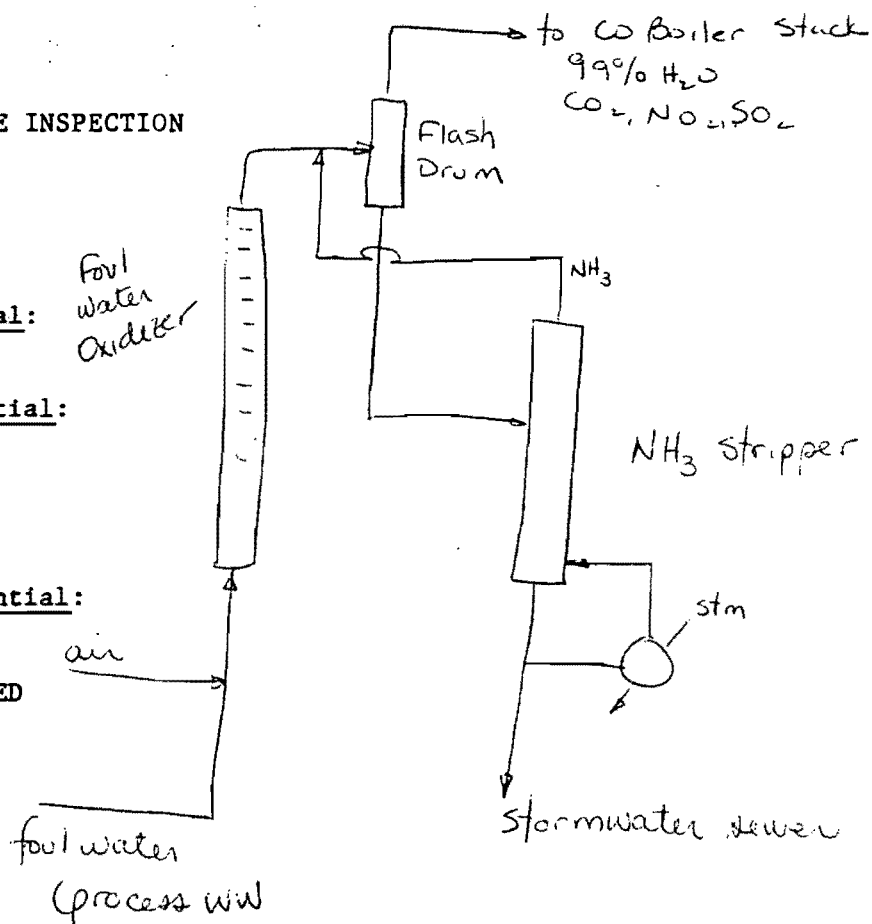
Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4...4 FURTHER ACTION REQUIRED



43

32 m plot

4.40 WEAK ACID NEUTRALIZATION SUMP

4..1 INFORMATION SUMMARY

Unit description: The weak acid neutralization sump is located west of the strong acid neutralization sump. It is five feet in diameter and eight feet deep. The sump is constructed of concrete with an acid-resistant brick liner.(7)

to acid sewer to neutral pit
caustic added @ sump

Date of startup: sump - Pb lined w/ fiberglass shell

Date of closure: This is an active unit.(7)

Wastes managed: This unit receives weak sulfuric acid from the Acid Plant. Here it is mixed with caustic to neutralize it to a pH of between 2 and 12.5. The neutralized effluent is discharged to the neutralization pond for secondary neutralization.(7)

+ surface drainage from
acid plant area

Release controls:

History of Releases: operator - Tony Oda
during T/A open sump - no solids

boarded up - wooden ~~plants~~ planks
on top

acid stream in PVC pipes.
can't see much on surface.
gravel around concrete pit

4..2 RESULTS OF VISUAL SITE INSPECTION

during his tenure (14r)

T/A 12-24 mo

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

44
#33 m/pl = t
4.41 STRONG ACID NEUTRALIZATION SUMP

4..1 INFORMATION SUMMARY

Unit description: The strong acid neutralization sump is located east of the weak acid neutralization plant. It is five feet in diameter and eight feet deep.(7)

used only w/ unit upset - drain from unit to neutral. pit.

Date of startup:

HLA, HLCI on pump

caustic add. point @ sump

Date of closure: This is an active unit.(7)

Wastes managed: The sump receives acid spills

Release controls:

History of Releases:

Acid sto tanks (3)
lined (w/?)
painted white - rust areas
showing thru -
curbing around tanks +
plant

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Amine plant out to
acid plant
MEA sto. drums

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

HLA = high level alarm
HLCI = high level cut in

45
4.42 Alkylation Plant Neutralization Sump

requires goggles
no goggles order
always water in it per
operator

4..1 INFORMATION SUMMARY

Unit description: The sump is located on the west end of the alkylation and isomerization plant. It measures 7 ft wide by 15 ft long by 7 ft deep. It is constructed of concrete and has an acid-resistant brick liner.(7)

Date of startup:

Date of closure: This is an active unit.(7)

Wastes managed: The sump receives acid spills and washdown water from the alkylation plant. Here they are mixed with caustic and neutralized to a pH between of 2 and 12.5. Sump effluent is discharged to the waste water treatment system ~~through the storm sewer system~~.(7)

Neutral. pH?

pH test / soda ash to
adjust

Release controls: The concrete sump is lined with acid-resistant brick.(7)

History of Releases:

{ SW corner Alky block
100' x 10'
black stain
some sheen

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

remains of past spill - H_2SO_4
ate path from horiz. vent. drum
to drain - ~1/2' deep, 4" wide

48
4.45 Oil Recovery Box (Waste oil Box)

4..1 INFORMATION SUMMARY

Unit description: The oil recovery box is located north of Tank 304. It is constructed of reinforced concrete and is 10 ft wide by 42 ft long by 5 ft high. (7) *above grade*

Date of startup:

Date of closure: This is an active unit. (7)

example sample line bleeds
solid / semi solid, viscous mat'l. liquified (med. pressure slm (40#)
+ pumped to recovered oil tank - #301/302

Wastes managed: Wastes placed in this unit include recovered oil from spills or cleanup of process systems. (The box serves as a settling unit for solids in the oily wastes.) Solids are periodically removed and placed in the land treatment unit. (7)

H/C drips on sides - about 4' above grade on west side.

Release controls:

suction pumps on South side

History of Releases:

*covered w/ pitch - heavy H/C.
steel grating - over = water fill*

grating caked w/ Heavy H/C

Tom to get back to me on disposition to oil recovery tanks

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

*v. messy area
(like PIAR)*

Surface water release potential:

messy area

Air release potential:

*solidified Heavy H/C
on ground around boxes*

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

46

4.48 STORM WATER CULVERT

4..1 INFORMATION SUMMARY

Unit description: Storm water from the area west of the storm ^{bay} ~~by~~, including the acid/amine plant, flows through a culvert to the ocean.(8)

Date of startup: stormwater runoff from Southern area - acid plant
open area

Date of closure: to be closed ^{by} 12/31/87 (uncontrolled discharge)

Wastes managed:

Release controls:

History of Releases:

4..2 RESULTS OF VISUAL SITE INSPECTION

4..3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4..4 FURTHER ACTION REQUIRED

see notes on back of 4.48

51
4.48 STORM BAY

4...1 INFORMATION SUMMARY

Unit description: The storm bay is a large wet well equipped with pumps. It is used to pump storm water to the north surge pond or to the north and outh ocean ponds.(8)

Date of startup:

Date of closure: This is an active unit.(8)

Wastes managed:

Release controls:

History of Releases:

4...2 RESULTS OF VISUAL SITE INSPECTION

4...3 CONCLUSIONS

Groundwater release potential:

Surface water release potential:

Air release potential:

Subsurface gas release potential:

4...4 FURTHER ACTION REQUIRED

from construction drawings:

